Appendix A: Property #4 – 1820 Forest

Christy Unta

Fields of Opportunities

STATE OF IOWA

THOMAS J. VILSACK, GOVERNOR
SALLY J. PEDERSON, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

March 18, 2005

MAR 2 3 2005

Duane Van Hemert
Executive Director/ Facilities Manager
Des Moines Independent Community School District
1658 E. Euclid
Des Moines, IA 50313

SUBJECT: Des Moines USTFields Environmental Assessment -- Former Gas Station Property 1820 (also listed as 1824) Forest Avenue in Des Moines, Iowa

Dear Mr. Van Hemert:

As you may be aware, the environmental condition of the above referenced property was recently assessed. The assessment was funded through an EPA grant and completed by Barker Lemar Engineering as part of the Des Moines USTFields Project. The goal of the USTFields Project is to identify and if necessary, cleanup contamination caused by leaks from underground storage tanks (USTs). Records indicate a gas station was in operation on this property during the 1940's and 1950's, therefore, it was included in the Des Moines USTFields Project.

The department received a Site Check Report, Electromagnetic Survey, and Report of Excavation Activities. The purpose of the site check was to determine if petroleum is present in soil or groundwater due to the historical operation of a service station. Results indicate concentrations of chemicals were below the action limits established by this department (see 567—135.14(455B) Iowa Administrative Code). In fact, petroleum contamination was not detected in any of the soil or groundwater samples collected from the property.

We were unable to determine from a record search whether the USTs were removed. Therefore, additional investigation was completed to try and locate old USTs (Electromagnetic/ Geoprobe Survey). During the geoprobe work, obstructions were encountered in the subsurface. As a follow-up to verify if these were tanks, a small area was excavated where the obstructions were noted. The excavation uncovered an old brick foundation, but no tanks were found.

Based on the findings of these investigations, the department will not require further action regarding the historical USTs. We will update our records to indicate a petroleum release was not verified.

For your records, we are providing you a copy of the reports. Additional information concerning the Des Moines USTFields project is available for public viewing at the DNR Records Center, Wallace State Office Building, 502 East Ninth Street, Des Moines, Iowa. You are welcome to review these files during regular business hours (8 a.m. - 4:30 p.m. Monday through Friday), or to request copies of the material at a fee of $0.40 per page.

Please contact me at 515/281-8011, if you have additional questions or we may be of further assistance.

Sincerely,

Elaine R. Douskey

ELAINE R. DOUSKEY
ENVIRONMENTAL SPECIALIST
UNDERGROUND STORAGE TANK SECTION

c: Field Office 5
Christy Jaworski, 1801 Industrial Circle West Des Moines, IA 50265
Ellen Walkowiak, Economic Development, City of Des Moines, 400 E. 1st Street, Des Moines, IA 50309

USTFsitechk_1820Forest doc

BARKER LEMAR

ENGINEERING CONSULTANTS

Summary of Activities

Iowa USTfields Project –
City of Des Moines
Property Owner – Polk County
1820 Forest Ave.
Des Moines, IA
Project No. IADNR 001
May 2004

1801 Industrial Circle, West Des Moines, Iowa 50265
(515) 256-8814 Fax (515) 256-0152

BARKER LEMAR
ENGINEERING CONSULTANTS

Summary of Activities
Iowa USTfields Project – City of Des Moines
Property Owner - Polk County
1820 Forest Avenue
Des Moines, IA

1.0 INTRODUCTION

BARKER LEMAR ENGINEERING CONSULTANTS was contracted by the Iowa Department of Natural Resources in partnership with the City of Des Moines, the EPA, and the Iowa Underground Storage Tank Financial Responsibility Program to assess and clean up contaminated sites within the pilot project area with the ultimate goal of redevelopment. The sites are located in the Drake Neighborhood area within the City of Des Moines.

Initial activities included identifying sites where potential petroleum contamination may be located which could hinder future development activities. The potential petroleum contaminated sites were identified by a search of Polk directories, Sanborn maps, review of IDNR underground storage tank and leaking underground storage tank records, and review of the Fire Marshall's records.

The site at 1820 Forest Avenue is currently owned by the Polk County. A station was originally built in 1946 and operated as a filling station until 1955.

2.0 RECORD REVIEW

Polk directories were reviewed at the Des Moines Library. The directory was reviewed in approximately five year intervals. Information in the directory indicated the site was a George Hannum Filling Station, 1946 through 1950, and a Clare Houghton Filling Station, through 1955. The 1956 Sanborn map showed a gas station located on the site and two tanks were reportedly located on the west side of the property approximately 40 feet south of Forest Avenue and 5 feet east of 19th Street.

BARKER LEMAR
ENGINEERING CONSULTANTS

Summary of Activities
Iowa USTfields Project – City of Des Moines
Property Owner - Polk County
1820 Forest Avenue
Des Moines, IA

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2.0 RECORD REVIEW

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According to Matt Porter with the Fire Department, no information is available on the type of tanks on site, when/if these tanks were removed, or if contamination was found during removal.

Site visual observations did not indicate evidence of underground storage tanks.

3.0 SOIL AND GROUNDWATER RESULTS

BARKER LEMAR personnel were on site February 23, 2004. Three soil borings were installed with a Geoprobe and converted to temporary monitoring wells. Boring logs are included in Appendix A. Borings were placed in the areas considered as potential former tank locations (B-2) and others were placed in order to triangulate the site and assess groundwater flow. Figure 1 is a site map showing the location of the borings/temporary monitoring wells.

Soil samples were screened approximately every two feet with a photoionization detector (PID). A soil sample was collected from each soil boring at the location of the highest PID, or if the PID did not detect hydrocarbons, at the assumed groundwater/soil interface. Samples were submitted to Keystone Laboratories in Newton, Iowa for BTEX/MTBE analysis by Iowa Method OA-1 by GC/MS and for total extractable hydrocarbon analysis by Iowa Method OA-2. Soil sample analytical results are summarized in Table 1.

Temporary wells were installed at the boring locations. Wells were purged of three volumes or bailed dry and groundwater samples were collected for analysis. Samples were submitted to Keystone Laboratories in Newton, Iowa for BTEX/MTBE analysis by Iowa Method OA-1 by GC/MS and for total extractable hydrocarbon analysis by Iowa Method OA-2 on April 16, 2004 (wells were dry at time of installation). TEH-diesel was not collected from boring B-2 because not enough water could be collected. Groundwater sample analytical results are summarized in Table 2.

Table 1

Analytical Results

Soil Sampling

Analyte	Units	Action Level	B-1 13-15'	B-2 13-15'	B-3 13-15'
Methyl-tert-Butyl Ether (MTBE)	mg/kg	NE	<0.010	<0.010	<0.010
Benzene	mg/kg	0.54	<0.005	<0.005	<0.005
Toluene	mg/kg	42	<0.005	<0.005	<0.005
Ethylbenzene	mg/kg	15	<0.005	<0.005	<0.005
Xylenes, Total	mg/kg	NE	<0.005	<0.005	<0.005
TEH, as #2 diesel fuel	mg/kg	3800	<5	<5	<5
TEH, as gasoline	mg/kg	NE	<5	<5	<5
TEH, as waste oil	mg/kg	NE	<5	<5	<5

Table 2

Analytical Results

Groundwater Sampling

Analyte	Units	Action Level	B-1	B-2	B-3
Methyl-tert-Butyl Ether (MTBE)	ug/L	NA	<2	<2	<1
Benzene	ug/L	5	<2	<2	<1
Toluene	ug/L	1000	<2	<2	<1
Ethylbenzene	ug/L	700	<2	<2	<1
Xylenes, Total	ug/L	1000	<4	<4	<2
TEH, as #2 diesel fuel	ug/L	1200	<200	NA	<200
TEH, as waste oil	ug/L	400	<200	NA	<200

4.0 CONCLUSION

BARKER LEMAR conducted assessment activities to assess potential petroleum contamination for property owned by Polk County at 1820 Forest Avenue in Des Moines, Iowa. Results of the activities did not locate underground storage tanks. Petroleum hydrocarbons were not detected in the soil or groundwater samples collected from the three temporary borings.

BARKER LEMAR
ENGINEERING CONSULTANTS

Groundwater depths in the temporary wells indicated groundwater flows to the northwest at this site.

We have appreciated being of service to you on this project. If you have any questions concerning this submittal, please do not hesitate to contact our office.

Sincerely,

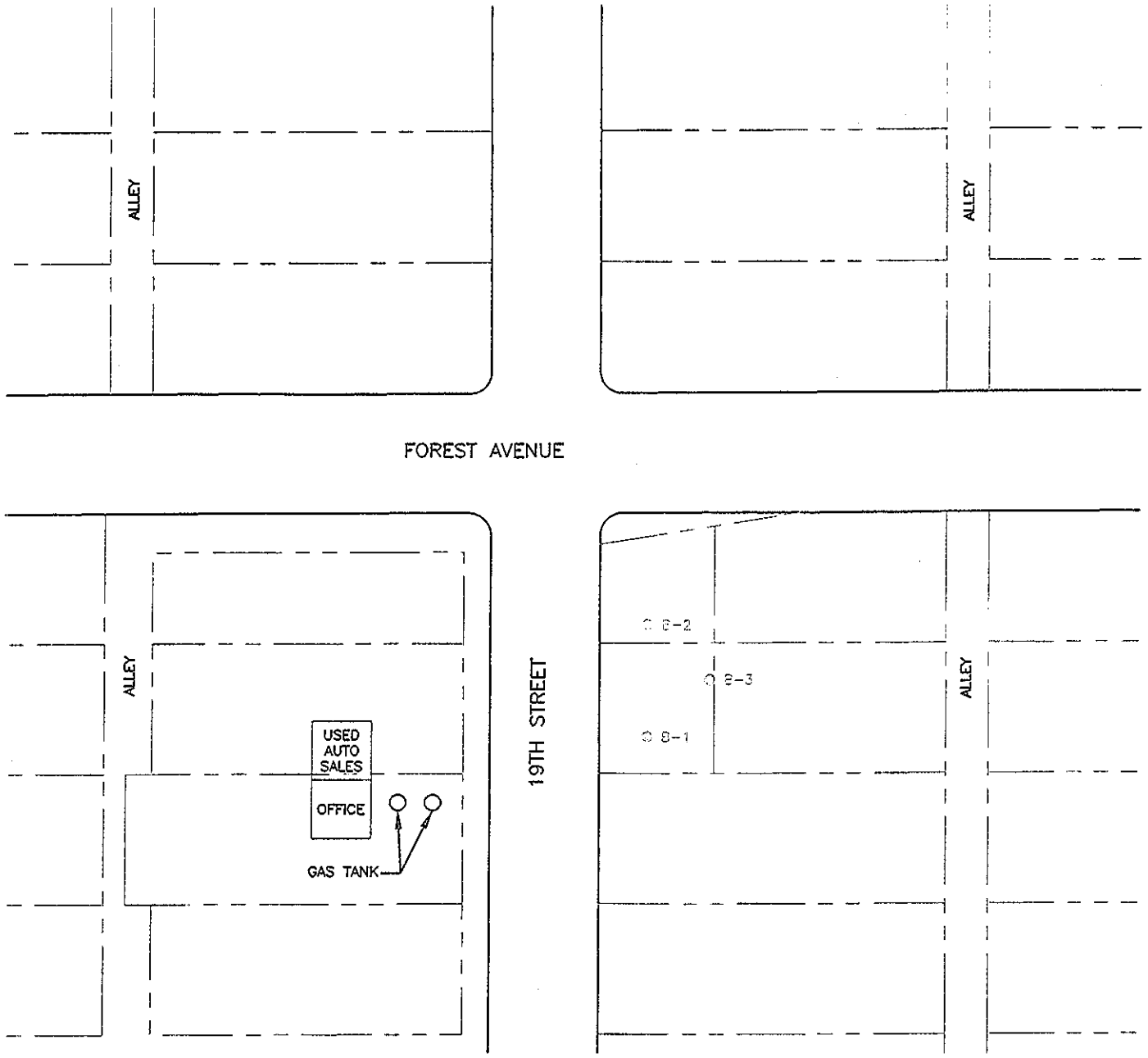
BARKER LEMAR ENGINEERING CONSULTANTS

Christy L. Jaworski
Senior Project Manager

Anita Maher-Lewis
Regional Manager

FIGURE 1

SITE PLAN MAP



LEGEND

B-n APPROXIMATE LOCATION OF BOREHOLE

PROPERTY BOUNDARY

SCALE

0 60 FT.

SITE MAP
BOREHOLE LOCATIONS
1820 FOREST AVE
PROJECT NO. IADNR 001
DRAWING DATE: MARCH, 2004

BARKER LEMAR
ENGINEERING CONSULTANTS
1801 Industrial Circle - West Des Moines, Iowa - 50265
Phone: 515.256.8814 - Fax: 515.256.0152 - www.barkerlemar.com

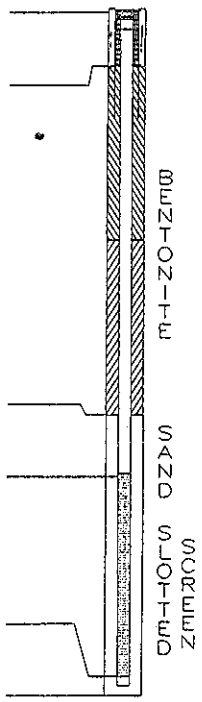
FIGURE
1

APPENDIX A

Boring/Monitoring Well Logs

MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: B-1	Facility Name: Polk County Property	Facility Street Address: 1820 Forest Avenue, Des Moines, IA
Boring Depth (ft) X Diameter (in): 17 5' X 2"		Drilling Method: Direct Push
Certified Well Contractor Name: Kevin Sperfslage Certification Number: 40530		Logged by: John Wyciskalla
Ground Surface Elevation (ASL): 100.68	Top of Casing Elevation (ASL): NA	
Date: 2/19/2004 Start Time:	Date: 2/19/2004 End Time:	UST Number: NA / LUST Number: NA

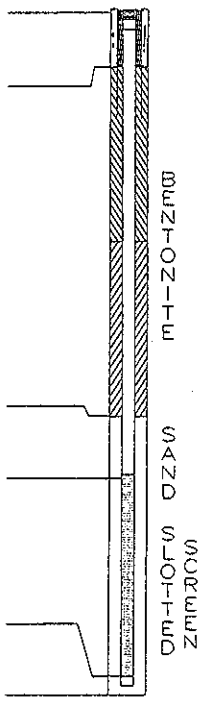
Depth (feet)	Well Construction Details (Temporary Monitoring Well)	Sample Depth (feet)	Sample No.	Type*	Field Screening Results (PID / FID)	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc) First column for USCS	
0.0		1-3'	1	SS	NR	CL	0.0–3.0 – Gravel, sand and asphalt
1.0		3-5'	2	SS	0		
		5-7'	3	SS	0	CL	3.0-7.0 – Light brown sandy lean clay with trace gravel
		7-9'	4	SS	0		
		9-11'	5	SS	0	CL	7.0-11.0 – Light brown to gray sandy lean clay
		*11-13'	6	SS	0		
		13-15'	7	SS	0	CL	11.0-17.5 – Gray silty lean clay
5.5		15-17	8	SS	0		
7.5							
17.0							17.5 End of Boring
17.5							

* Sample collected for laboratory analysis SS – Spilt Spoon NR – No Recovery

Observations	Date:	3/5/04				
Water Levels (ASL)	Level:	5.4				
Static Water Level Symbol (v)	Time:					

MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: B-2	Facility Name: Polk County Property	Facility Street Address: 1820 Forest Avenue, Des Moines, IA
Boring Depth (ft) X Diameter (in): 15.0' X 2"		Drilling Method: Direct Push
Certified Well Contractor Name: Kevin Sperfslage Certification Number: 40530		Logged by: John Wyciskalla
Ground Surface Elevation (ASL): 100.22	Top of Casing Elevation (ASL): NA	
Date: 2/19/2004 Start Time:	Date: 2/19/2004 End Time:	UST Number: NA / LUST Number: NA

Depth (feet)	Well Construction Details (Temporary Monitoring Well)	Sample Depth (feet)	Sample No	Sample Type*	Field Screening Results (PID / FID)	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	
0 0		1-3'	1	SS	NR	CL	0 0–1.0 – Gravel
1.0		3-5'	2	SS	0	CL	1.0-3 0 – Brown silty lean clay with sand
		5-7'	3	SS	0		
		7-9'	4	SS	0	CL	3.0-9.0 – Tan silty lean clay with sand
		9-11'	5	SS	0		
		11-13'	6	SS	0	CL	9.0-13 0 – Gray lean clay with sand and gravel
		*13-15'	7	SS	0		
8.0						CL	13.0-15.0 – Dark gray fat clay
10 0							
15.0							
15 0							15 0 End of Boring

* Sample collected for laboratory analysis SS – Spilt Spoon NR – No Recovery

Observations	Date:	3/5/04				
Water Levels (ASL)	Level:	2.75				
Static Water Level Symbol (v)	Time:					

MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: B-3	Facility Name: Polk County Property	Facility Street Address: 1820 Forest Avenue, Des Moines, IA
Boring Depth (ft) X Diameter (in): 15.0' X 2"		Drilling Method: Direct Push
Certified Well Contractor Name: Kevin Sperfslage Certification Number: 40530		Logged by: John Wyciskalla
Ground Surface Elevation (ASL): 100.42	Top of Casing Elevation (ASL): NA	
Date: 2/19/2004 Start Time:	Date: 2/19/2004 End Time:	UST Number: NA / LUST Number: NA

Depth (feet)	Well Construction Details (Temporary Monitoring Well)	Sample Depth (feet)	Sample No.	Type*	Field Screening Results (PID / FID)	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	
		0-1'	1	SS	NR	CL	0.0–1.0 – Gravel
0.0		1-3'	2	SS	0	CL	1.0-3.0 – Brown sand with brown lean clay and gravel
1.0		3-5'	3	SS	0		
		5-7'	4	SS	0		
	BENTONITE	7-9'	5	SS	0	CL	3.0-5.0 – Brown lean clay with sand and gravel
		9-11'	6	SS	0		
		11-13'	7	SS	0	CL	5.0-11.0 – Brown-gray silty lean clay with sand and gravel
8.0		13-15'	8	SS			
10.0	SAND SLOTTED SCREEN					CL	11.0-15.0 – Gray silty lean clay with sand and gravel
15.0							
15.0							15.0 End of Boring

* Sample collected for laboratory analysis SS – Spilt Spoon NR – No Recovery

Observations	Date:	3/5/04				
Water Levels (ASL)	Level:	7 75				
Static Water Level Symbol (v)	Time:					

APPENDIX B

Laboratory Analytical Results

Keystone
LABORATORIES, INC.

ACCREDITED IN ACCORDANCE WITH nelac

MEMBER ACIL

Accreditations:
Iowa DNR: 095
New Jersey DEP: IA001
Kansas DHE: E-10287

ANALYTICAL REPORT

March 08, 2004

Work Order: 14B0895

Report To

Christy Jaworski
Barker-Lemar Associates
1801 Industrial Circle
Des Moines, IA 50315

Work Order Information

Date Received: 02/24/2004 11:10AM
Collector: Wociskalla, J.
Phone: 515-256-8814
PO Number:

Project : UST-Iowa
Project Number: 1820 Forest-IDNR

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
14B0895-01 B-1 13-15'				Matrix:Soil		Collected: 02/23/04 00:00	
Determination of Volatile Petroleum Hydrocarbons							
Benzene	<0.005 mg/kg	0.005	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
Toluene	<0.005 mg/kg	0.005	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
Ethylbenzene	<0.005 mg/kg	0.005	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
Xylenes, total	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
Methyl-t-butyl Ether (MTBE)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
Di-iso-Propyl Ether (DIPE)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
Ethyl-tert-Butyl Ether (ETBE)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
tert-Amyl Methyl Ether (TAME)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
tert-Butyl Alcohol (TBA)	<0.250 mg/kg	0.250	1C40230	OA-1 (GC/MS)	JRF	03/02/04 15:56	
Surrogate 4-Bromofluorobenzene	*89.4 %*			*81-127*	JRF	03/02/04 15:56	
Determination of Extractable Petroleum Hydrocarbons							
TEH, as gasoline	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04 0:35	
TEH, as #2 diesel fuel	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04 0:35	
TEH, as waste oil	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04 0:35	
Total Extractable Hydrocarbons	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04 0:35	
Surrogate Pentacosane	*94.7 %*			*60-140*	SMG	03/08/04 0:35	
14B0895-02 B-2 13-15'				Matrix:Soil		Collected: 02/23/04 00:00	
Determination of Volatile Petroleum Hydrocarbons							
Benzene	<0.005 mg/kg	0.005	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
Toluene	<0.005 mg/kg	0.005	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
Ethylbenzene	<0.005 mg/kg	0.005	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
Xylenes, total	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
Methyl-t-butyl Ether (MTBE)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
Di-iso-Propyl Ether (DIPE)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
Ethyl-tert-Butyl Ether (ETBE)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
tert-Amyl Methyl Ether (TAME)	<0.010 mg/kg	0.010	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
tert-Butyl Alcohol (TBA)	<0.250 mg/kg	0.250	1C40230	OA-1 (GC/MS)	JRF	03/02/04 16:38	
Surrogate 4-Bromofluorobenzene	*88.4 %*			*81-127*	JRF	03/02/04 16:38	
Determination of Extractable Petroleum Hydrocarbons							
TEH, as gasoline	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04 1:24	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

Barker-Lemar Associates
1801 Industrial Circle
Des Moines, IA 50315

March 08, 2004

Work Order: 14B0895

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
14B0895-02 B-2 13-15'				Matrix:Soil	Collected: 02/23/04 00:00		
Determination of Extractable Petroleum Hydrocarbons							
TEH, as #2 diesel fuel	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04	1:24
TEH, as waste oil	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04	1:24
Total Extractable Hydrocarbons	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04	1:24
Surrogate Pentacosane	*101 %*			*60-140*	SMG	03/08/04	1:24
14B0895-03 B-3 13-15'				Matrix:Soil	Collected: 02/23/04 00:00		
Determination of Volatile Petroleum Hydrocarbons							
Benzene	<0 005 mg/kg	0 005	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
Toluene	<0 005 mg/kg	0 005	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
Ethylbenzene	<0 005 mg/kg	0 005	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
Xylenes, total	<0 010 mg/kg	0 010	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
Methyl-t-butyl Ether (MTBE)	<0 010 mg/kg	0 010	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
Di-iso-Propyl Ether (DIPE)	<0 010 mg/kg	0 010	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
Ethyl-tert-Butyl Ether (ETBE)	<0 010 mg/kg	0 010	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
tert-Amyl Methyl Ether (TAME)	<0 010 mg/kg	0 010	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
tert-Butyl Alcohol (TBA)	<0 250 mg/kg	0 250	1C40230	OA-1 (GC/MS)	JRF	03/02/04	17:19
Surrogate 4-Bromofluorobenzene	*91 3 %*			*81-127*	JRF	03/02/04	17:19
Determination of Extractable Petroleum Hydrocarbons							
TEH, as gasoline	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04	2:13
TEH, as #2 diesel fuel	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04	2:13
TEH, as waste oil	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04	2:13
Total Extractable Hydrocarbons	<5 mg/kg	5	1C40517	Iowa OA-2	SMG	03/08/04	2:13
Surrogate Pentacosane	*92 6 %*			*60-140*	SMG	03/08/04	2:13

The results in this report apply to the samples analyzed in accordance with the chain of custody document This analytical report must be reproduced in its entirety Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted MRL= Method Reporting Limit

Barker-Lemar Associates
1801 Industrial Circle
Des Moines, IA 50315

Work Order: 14B0895

March 08, 2004

Determination of Volatile Petroleum Hydrocarbons - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1C40230 - EPA 5030B										
Blank (1C40230-BLK1)				Prepared & Analyzed: 03/02/04						
Benzene	ND	0 005	mg/kg							
Toluene	ND	0 005	"							
Ethylbenzene	ND	0 005	"							
Xylenes, total	ND	0 010	"							
Methyl-t-butyl Ether (MTBE)	ND	0 010	"							
Di-iso-Propyl Ether (DIPE)	ND	0 010	"							
Ethyl-tert-Butyl Ether (ETBE)	ND	0 010	"							
tert-Amyl Methyl Ether (TAME)	ND	0 010	"							
tert-Butyl Alcohol (TBA)	ND	0 250	"							
Surrogate 4-Bromofluorobenzene	*0 2164*		"	*0 2500*		*86 6*	*81-127*			
Calibration Check (1C40230-CCV1)				Prepared & Analyzed: 03/02/04						
Benzene	0 4134	0 005	mg/kg	0 4050		102	70-130			
Toluene	0 3572	0 005	"	0 3325		107	70-130			
Ethylbenzene	0 3852	0 005	"	0 3475		111	70-130			
Xylenes, total	0 7862	0 010	"	0 7725		102	70-130			
Methyl-t-butyl Ether (MTBE)	0 2934	0 010	"	0 3425		85 7	70-130			
Di-iso-Propyl Ether (DIPE)	0 2580	0 010	"	0 3150		81 9	70-130			
Ethyl-tert-Butyl Ether (ETBE)	0 2771	0 010	"	0 3350		82 7	70-130			
tert-Amyl Methyl Ether (TAME)	0 2900	0 010	"	0 2925		99 1	70-130			
tert-Butyl Alcohol (TBA)	4 148	0 250	"	4 975		83 4	70-130			
Surrogate 4-Bromofluorobenzene	*0 2192*		"	*0 2500*		*87 7*	*81-127*			
Matrix Spike (1C40230-MS1)	**Source: 14B0881-04**			Prepared & Analyzed: 03/02/04						
Benzene	0 3530	0 005	mg/kg	0 3785	ND	93 3	66-140			
Toluene	0 3112	0 005	"	0 3107	ND	100	66-132			
Ethylbenzene	0 3607	0 005	"	0 3248	ND	111	60-140			
Xylenes, total	0 7036	0 010	"	0 7220	ND	97 5	71-128			
Methyl-t-butyl Ether (MTBE)	0 2592	0 010	"	0 3201	ND	81 0	64-120			
Surrogate 4-Bromofluorobenzene	*0 2016*		"	*0 2336*		*86 3*	*81-127*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document This analytical report must be reproduced in its entirety Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL = Method Reporting Limit

Barker-Lemar Associates
1801 Industrial Circle
Des Moines, IA 50315

March 08, 2004

Work Order: 14B0895

Determination of Volatile Petroleum Hydrocarbons - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1C40230 - EPA 5030B										
Matrix Spike Dup (1C40230-MSD1)		**Source: 14B0881-04**		Prepared & Analyzed: 03/02/04						
Benzene	0 3815	0 005	mg/kg	0 3894	ND	98 0	66-140	7 76	27	
Toluene	0 3256	0 005	"	0 3197	ND	102	66-132	4 52	25	
Ethylbenzene	0 3637	0 005	"	0 3341	ND	109	60-140	0 828	27	
Xylenes, total	0 7342	0 010	"	0 7428	ND	98 8	71-128	4 26	25	
Methyl-t-butyl Ether (MIBE)	0 2923	0 010	"	0 3293	ND	88 8	64-120	12 0	26	
Surrogate: 4-Bromofluorobenzene	*0 2174*		*"*	*0 2404*		*90 4*	*81-127*			

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Barker-Lemar Associates
1801 Industrial Circle
Des Moines, IA 50315

March 08, 2004

Work Order: 14B0895

Determination of Extractable Petroleum Hydrocarbons - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1C40517 - 3550B OA-2 Sonic										
Blank (1C40517-BLK1)				Prepared: 03/05/04 Analyzed: 03/07/04						
TEH, as gasoline	ND	5	mg/kg							
TEH, as #2 diesel fuel	ND	5	"							
TEH, as waste oil	ND	5	"							
Total Extractable Hydrocarbons	ND	5	"							
Surrogate: Pentacosane	*2.53*		"	*2.49*		*102*	*60-140*			
LCS (1C40517-BS1)				Prepared: 03/05/04 Analyzed: 03/08/04						
TEH, as #2 diesel fuel	474.7	5	mg/kg	500.4		94.9	61-110			
Surrogate: Pentacosane	*2.49*		"	*2.49*		*100*	*60-140*			
Calibration Check (1C40517-CCV1)				Prepared: 03/05/04 Analyzed: 03/08/04						
TEH, as gasoline	2102		mg/kg	2050		103	85-115			
TEH, as #2 diesel fuel	2270		"	2100		108	85-115			
TEH, as waste oil	2066		"	2030		102	85-115			
Surrogate: Pentacosane	*47.7*		"	*49.8*		*95.8*	*60-140*			
Calibration Check (1C40517-CCV2)				Prepared: 03/05/04 Analyzed: 03/08/04						
TEH, as gasoline	2046		mg/kg	2050		99.8	85-115			
TEH, as #2 diesel fuel	2139		"	2100		102	85-115			
TEH, as waste oil	1785		"	2030		87.9	85-115			
Surrogate: Pentacosane	*47.8*		"	*49.8*		*96.0*	*60-140*			
Matrix Spike (1C40517-MS1)	**Source: 14B0864-11**			Prepared: 03/05/04 Analyzed: 03/08/04						
TEH, as #2 diesel fuel	446.6	5	mg/kg	499.0	ND	89.5	51-110			
Surrogate: Pentacosane	*2.38*		"	*2.48*		*96.0*	*60-140*			
Matrix Spike Dup (1C40517-MSD1)	**Source: 14B0864-11**			Prepared: 03/05/04 Analyzed: 03/08/04						
TEH, as #2 diesel fuel	445.7	5	mg/kg	499.5	ND	89.2	51-110	0.202	18	
Surrogate: Pentacosane	*2.37*		"	*2.49*		*95.2*	*60-140*			

ND = Non Detect; REC= Recovery; RPD= Relative Percent Difference

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Barker-Lemar Associates
1801 Industrial Circle
Des Moines, IA 50315

Work Order: 14B0895

March 08, 2004
Page 6 of 6

End of Report

Jeffrey King

Keystone Laboratories, Inc.
Jeffrey King, Ph.D.
Laboratory Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit

Repo

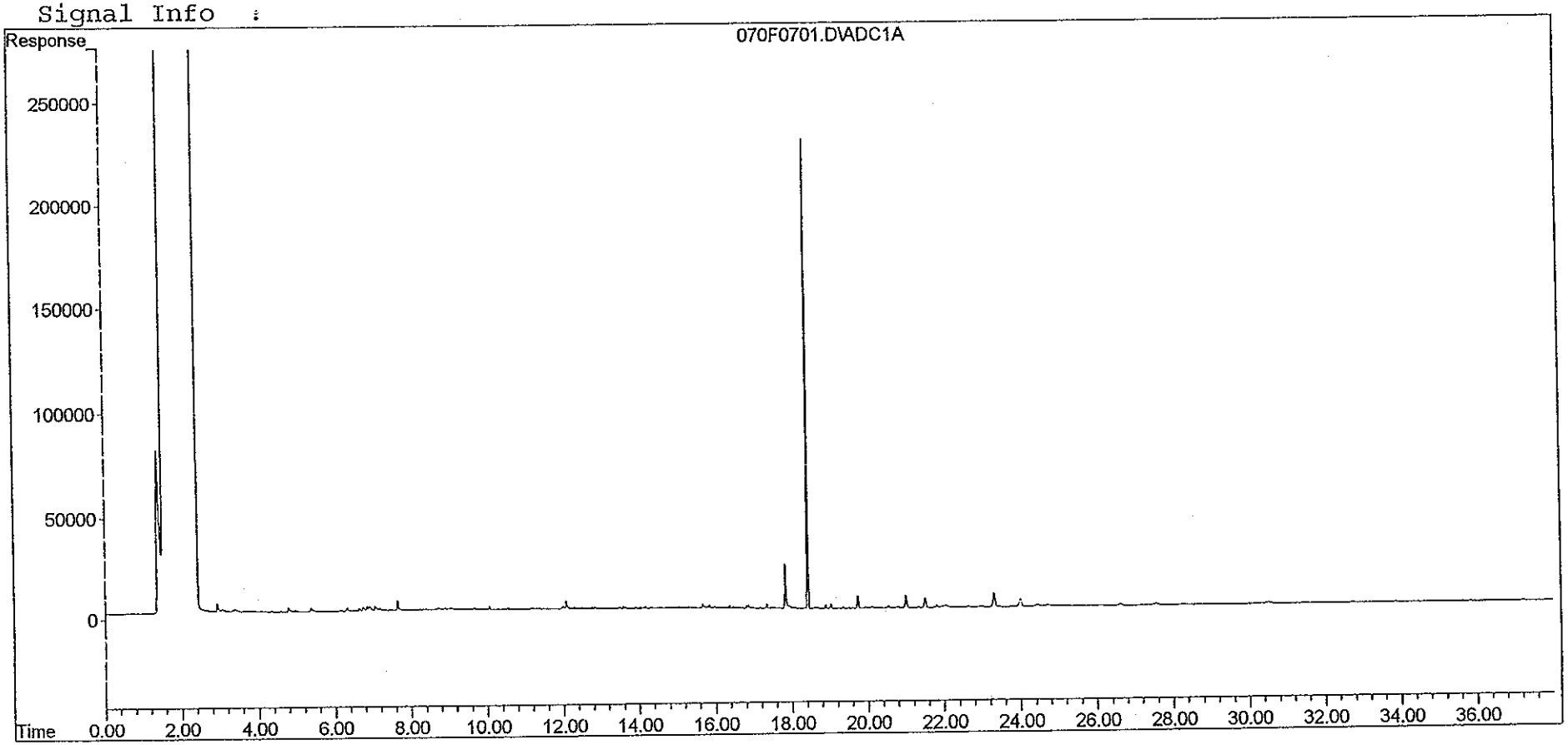
Data File : G:\HPCHEM\2\DATA\030504A2\070F0701.D
Acq On : 08 Mar 2004 00:35 AM
Sample : 14B0895-01
Misc :
IntFile : HYDRO.E
Quant Time: Mar 8 9:35 19104 Quant Results File: F022304.RES

Vial: 70
Operator: SMG
Inst : GC #2
Multiplr: 1.00

Quant Method : G:\HPCHEM\2\METHODS\F022304.M (Chemstation Integrator)
Title : 8015-500/OA-2 Method
Last Update : Tue Feb 24 08:57:51 2004
Response via : Multiple Level Calibration
DataAcq Meth : DIESEL.MTH

Keystone Laboratories, Inc.
600 East 17th St. Suite
Newton, IA

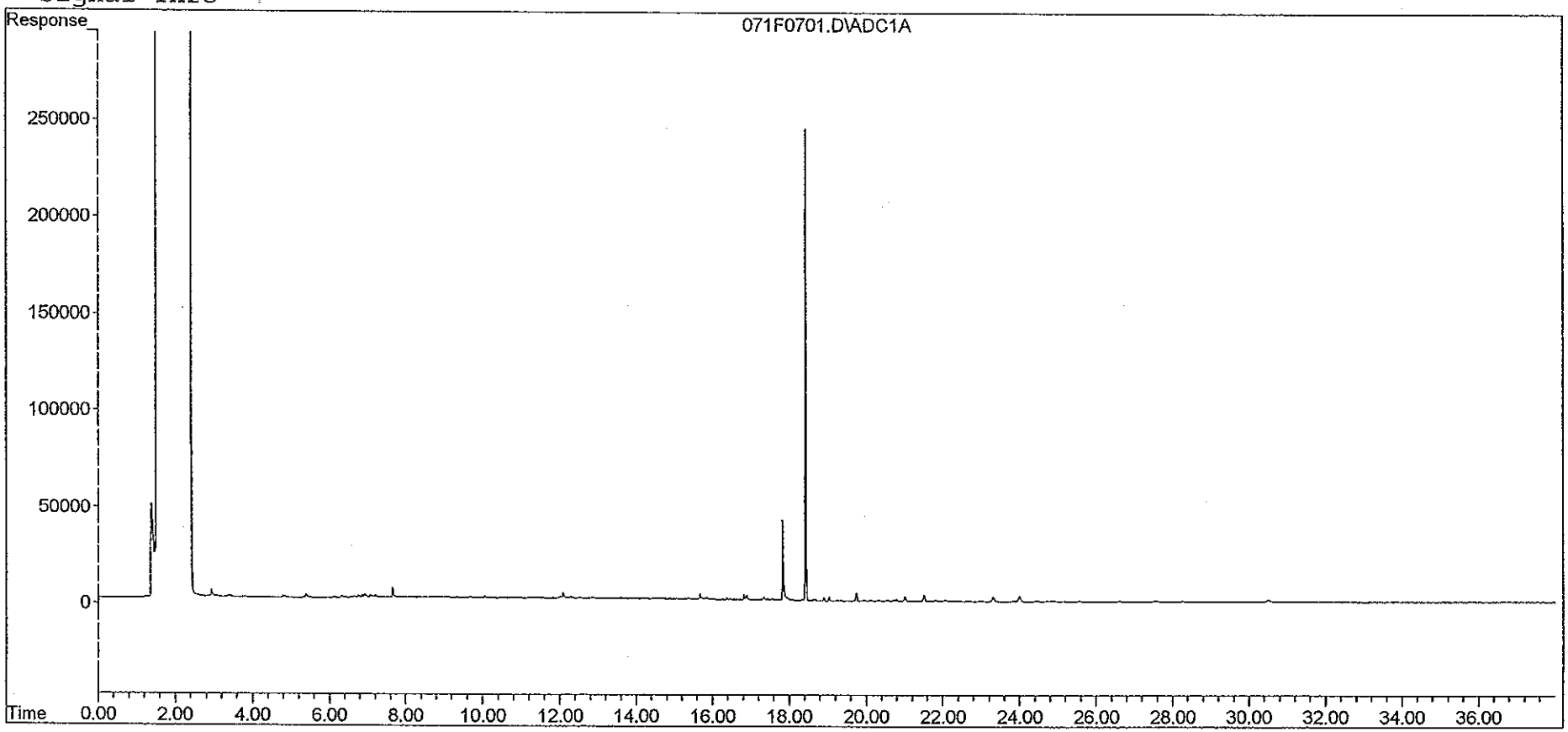
Volume Inj :
Signal Phase :
Signal Info :



Data File : G:\HPCHEM\2\DATA\030504A2\071F0701.D Vial: 71
Acq On : 08 Mar 2004 01:24 AM Operator: SMG
Sample : 14B0895-02 Inst : GC #2
Misc : Multiplr: 1.00
IntFile : HYDRO.E
Quant Time: Mar 8 9:36 19104 Quant Results File: F022304.RES

Quant Method : G:\HPCHEM\2\METHODS\F022304.M (Chemstation Integrator)
Title : 8015-500/OA-2 Method
Last Update : Tue Feb 24 08:57:51 2004
Response via : Multiple Level Calibration
DataAcq Meth : DIESEL.MTH

Volume Inj :
Signal Phase :
Signal Info :



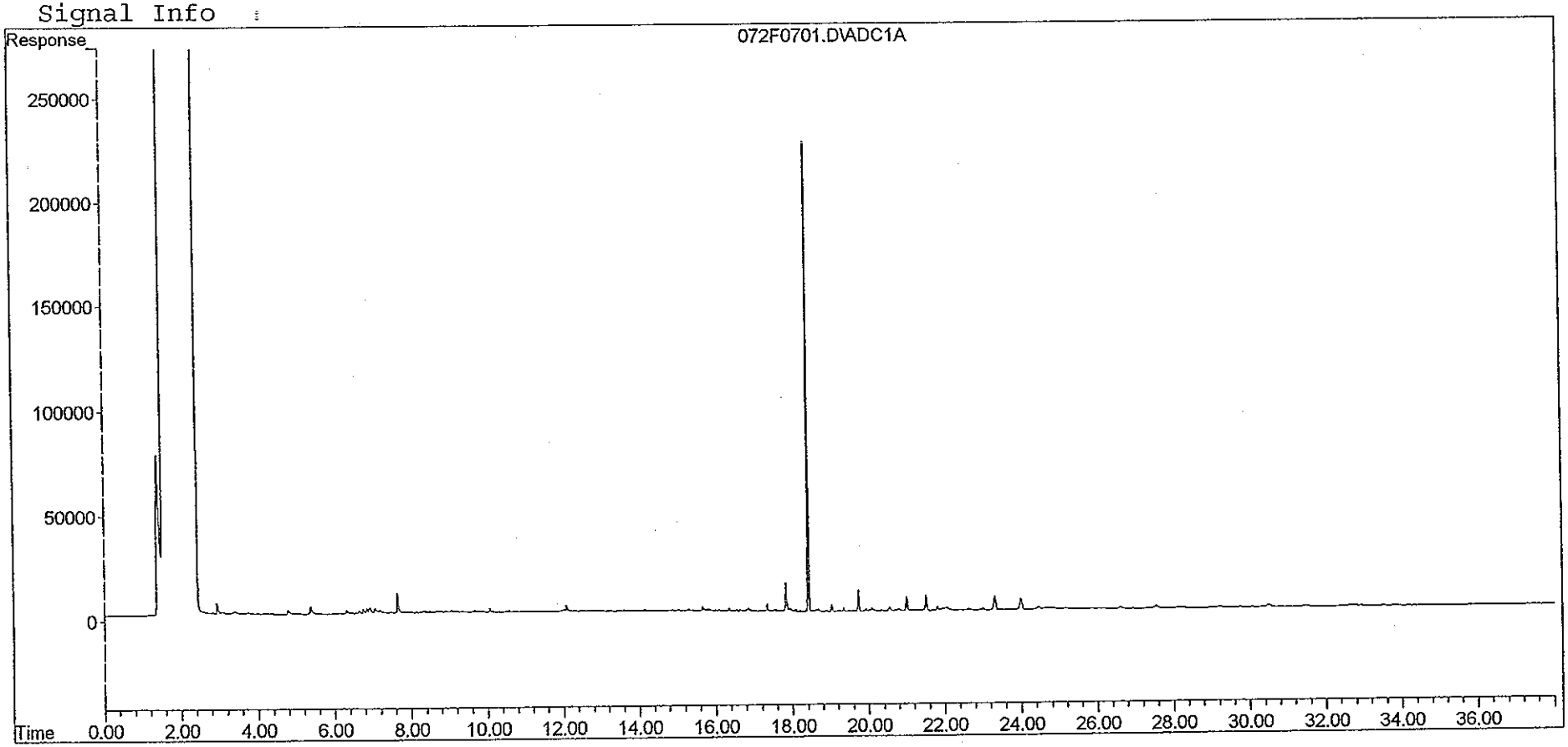
Data File : G:\HPCHEM\2\DATA\030504A2\072F0701.D
Acq On : 08 Mar 2004 02:13 AM
Sample : 14B0895-03
Misc :
IntFile : HYDRO.E
Quant Time: Mar 8 9:37 19104 Quant Results File: F022304.RES

Vial: 72
Operator: SMG
Inst : GC #2
Multiplr: 1.00

Quant Method : G:\HPCHEM\2\METHODS\F022304.M (Chemstation Integrator)
Title : 8015-500/OA-2 Method
Last Update : Tue Feb 24 08:57:51 2004
Response via : Multiple Level Calibration
DataAcq Meth : DIESEL.MTH

600 East 17th
Newton, IA 50208

Volume Inj :
Signal Phase :
Signal Info :



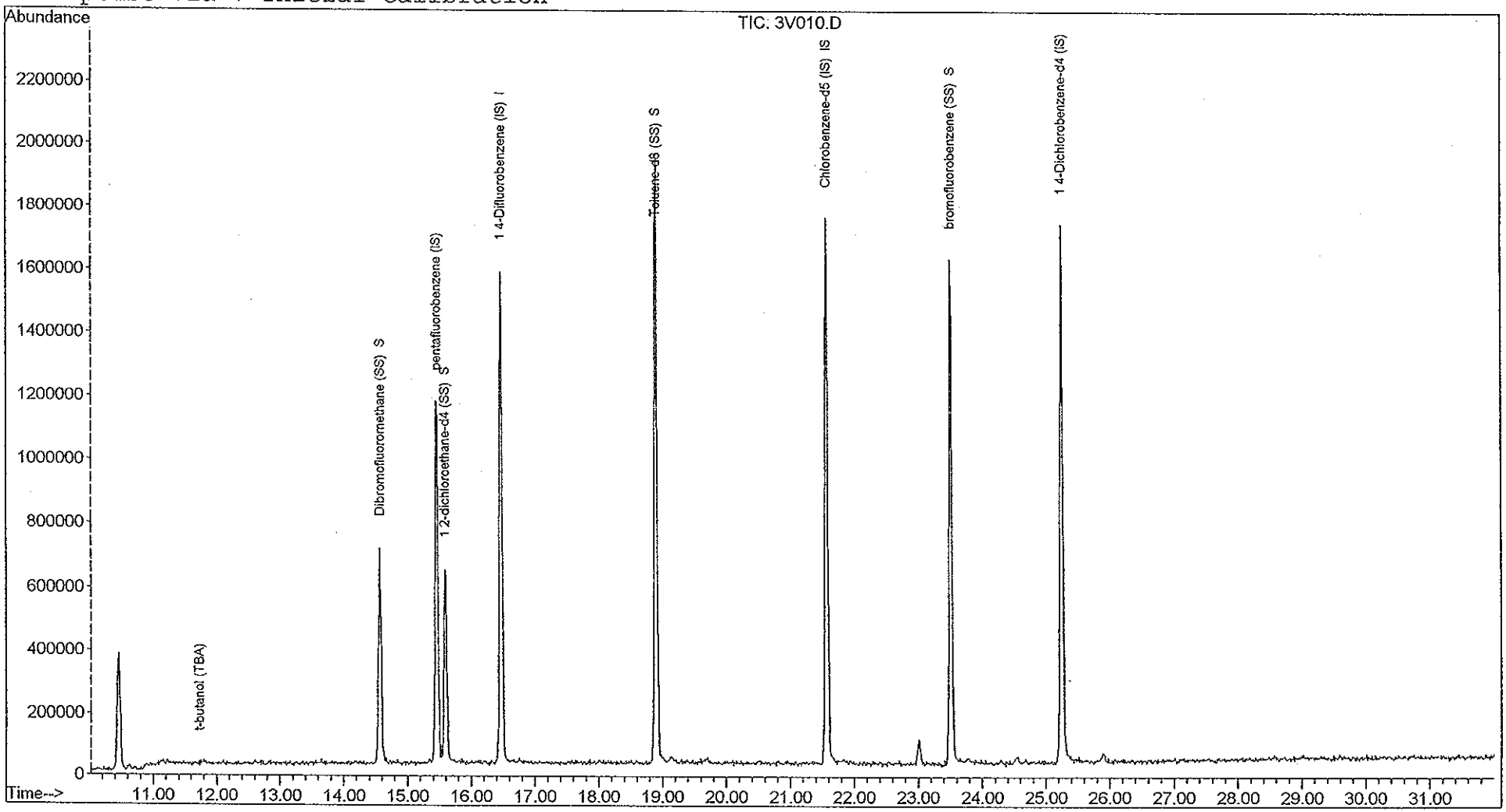
Data File : G:\MSCHEM\3\DATA\030204A3\3V010.D
Acq On : 2 Mar 2004 3:56 pm
Sample : 14B0895-01
Misc :
MS Integration Params: rteint.p
Quant Time: Mar 3 7:29 2004

Vial: 2
Operator: JRF
Inst : MS #3
Multiplr: 1.00

Quant Results File: BS022504.RES

Method : G:\MSCHEM\3\METHODS\BS022504.M (RTE Integrator)
Title : BTEX Soil
Last Update : Thu Feb 26 10:08:34 2004
Response via : Initial Calibration

600 East 17th St.
Newton, IA 50208

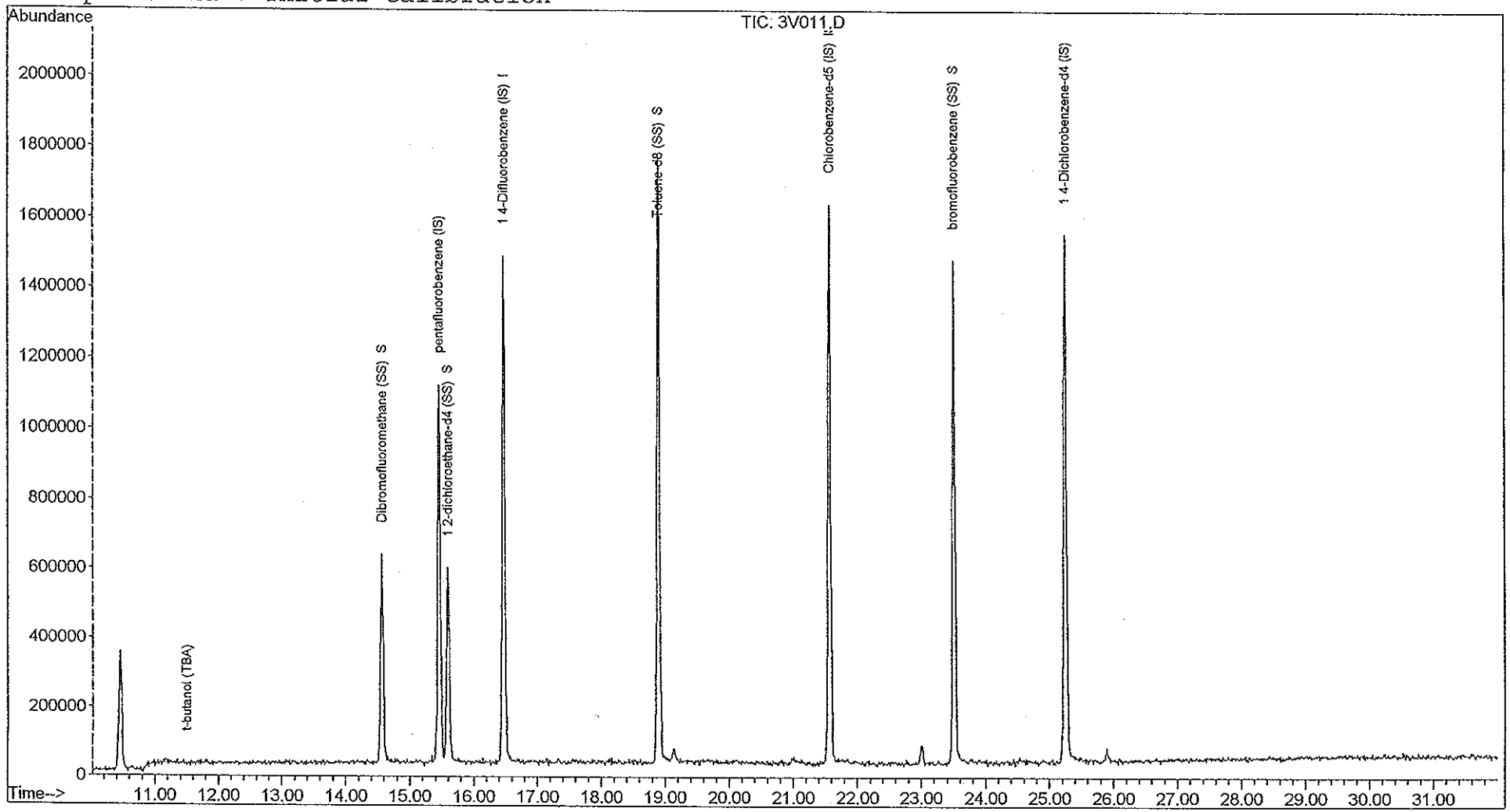


Data File : G:\MSCHEM\3\DATA\030204A3\3V011.D
Acq On : 2 Mar 2004 4:38 pm
Sample : 14B0895-02
Misc :
MS Integration Params: rteint.p
Quant Time: Mar 3 7:29 2004

Vial: 3
Operator: JRF
Inst : MS #3
Multiplr: 1.00

Quant Results File: BS022504.RES

Method : G:\MSCHEM\3\METHODS\BS022504.M (RTE Integrator)
Title : BTEX Soil
Last Update : Thu Feb 26 10:08:34 2004
Response via : Initial Calibration



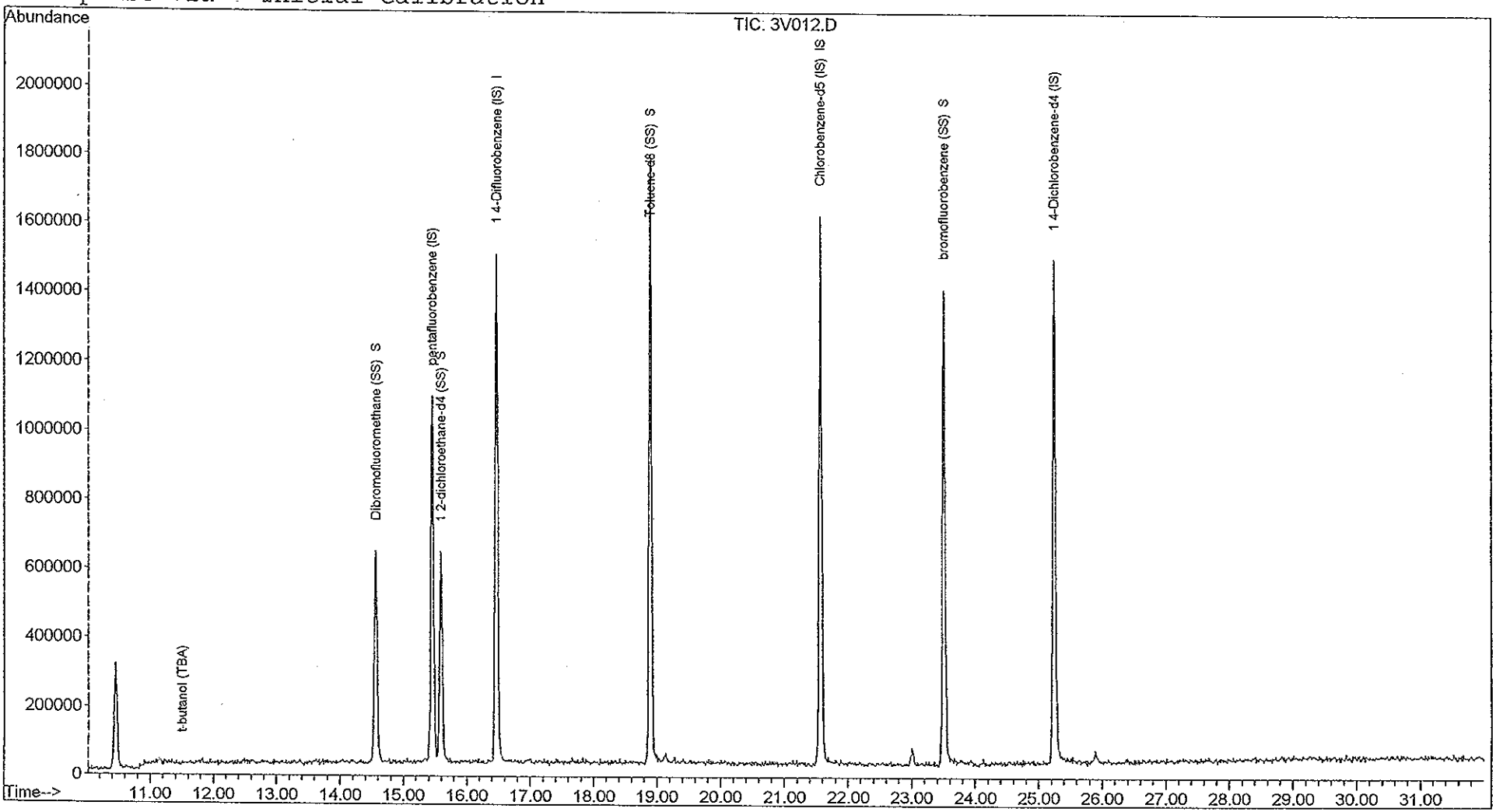
Data File : G:\MSCHEM\3\DATA\030204A3\3V012.D
Acq On : 2 Mar 2004 5:19 pm
Sample : 14B0895-03
Misc :
MS Integration Params: rteint.p
Quant Time: Mar 3 7:29 2004

Vial: 4
Operator: JRF
Inst : MS #3
Multiplr: 1.00

Quant Results File: BS022504.RES

Method : G:\MSCHEM\3\METHODS\BS022504.M (RTE Integrator)
Title : BTEX Soil
Last Update : Thu Feb 26 10:08:34 2004
Response via : Initial Calibration

Keystone Laboratories, Inc.
600 East 17th St. South
Newton, IA 50208



CHAIN OF CUSTODY RECORD

Keystone LABORATORIES, INC.

☒ 600 E. 17th St. S.
Newton, IA 50208
Phone: 641-792-8451
Fax: 641-792-7989

☐ 3012 Ansborough Ave.
Waterloo, IA 50701
Phone: 319-235-4440
Fax: 319-235-2480

☐ 1304 Adams
Kansas City, KS 66103
Phone: 913-321-7856
Fax: 913-321-7937

PRINT OR TYPE INFORMATION BELOW
SAMPLER: J. Wmciskalla
SITE NAME: 1820 Forest - IDVR
ADDRESS:
CITY/ST/ZIP: Des Moines, IA
PHONE:

REPORT TO:
NAME: Christy Jaworski
COMPANY NAME: [illegible]
ADDRESS:
CITY/ST/ZIP:
PHONE:
FAX:

BILL TO:
NAME:
COMPANY NAME:
ADDRESS:
CITY/ST/ZIP:
PHONE:
Keystone Quote No.: (If Applicable)

CLIENT SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	NO. OF CONTAINERS	MATRIX	GRAB/COMPOSITE	ANALYSES REQUIRED: BTEX/MTBE G/HS	TEH by oil							SAMPLE CONDITION/COMMENTS	LABORATORY SAMPLE NUMBER
B-1	2/23/04		13-15'	2	SOIL	G	X	X								01
B-2	2/23/04		13-15'	2	SOIL	G	X	X								02
B-3	2/23/04		13-15'	2	SOIL	G	X	X								03

LAB USE ONLY
LABORATORY WORK ORDER NO. 14B0895
SAMPLE TEMPERATURE UPON RECEIPT: °C

Relinquished by: (Signature) [signature] Date 2/21/04 Time 0830
Received by: (Signature) Date Time
Relinquished by: (Signature) Date Time
Received for Lab by: (Signature) [signature] Date 2/24/04 Time 11:10 AM

Turn-Around: ☒ Standard ☐ Rush ______ Contact Lab Prior to Submission
Remarks:

Keystone
LABORATORIES, INC

ACCREDITED IN ACCORDANCE WITH nelac

MEMBER ACIL

Accreditations:
Iowa DNR: 095
New Jersey DEP: IA001
Kansas DHE: E-10287

ANALYTICAL REPORT

April 30, 2004

Work Order: 14D0836

Report To	Work Order Information
Christy Jaworski Barker-Lemar Associates 1801 Industrial Circle West Des Moines, IA 50265	Date Received: 04/16/2004 12:35PM Collector: Kevin Hersley Phone: 515-256-8814 PO Number:

Project : UST-Iowa
Project Number: IA DNR 001

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
14D0836-01 B-1				Matrix:Water	Collected: 04/16/04 11:00		
Determination of Volatile Petroleum Hydrocarbons							
Benzene	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
Toluene	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
Ethylbenzene	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
Xylenes, total	<4 ug/l	4	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
Methyl-t-butyl Ether (MTBE)	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
Ethyl-tert-Butyl Ether (ETBE)	<4 ug/l	4	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
Di-iso-Propyl Ether (DIPE)	<4 ug/l	4	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
tert-Amyl Methyl Ether (TAME)	<4 ug/l	4	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
tert-Butyl Alcohol (TBA)	<100 ug/l	100	1D42221	OA-1 (GC/MS)	IVK	04/21/04 23:15	
Surrogate 4-Bromofluorobenzene	*106 %*			*81-124*	IVK	04/21/04 23:15	
Determination of Extractable Petroleum Hydrocarbons							
TEH, as gasoline	<0.2 mg/l	0.2	1D42331	Iowa OA-2	SMG	04/28/04 18:41	
TEH, as #2 diesel fuel	<0.2 mg/l	0.2	1D42331	Iowa OA-2	SMG	04/28/04 18:41	
TEH, as waste oil	<0.2 mg/l	0.2	1D42331	Iowa OA-2	SMG	04/28/04 18:41	
Total Extractable Hydrocarbons	<0.2 mg/l	0.2	1D42331	Iowa OA-2	SMG	04/28/04 18:41	
Surrogate: Pentacosane	*81.0 %*			*70-130*	SMG	04/28/04 18:41	
14D0836-02 B-2				Matrix:Water	Collected: 04/16/04 11:15		
Determination of Volatile Petroleum Hydrocarbons							
Benzene	<2 ug/l	2	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
Toluene	<2 ug/l	2	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
Ethylbenzene	<2 ug/l	2	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
Xylenes, total	<4 ug/l	4	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
Methyl-t-butyl Ether (MTBE)	<2 ug/l	2	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
Ethyl-tert-Butyl Ether (ETBE)	<4 ug/l	4	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
Di-iso-Propyl Ether (DIPE)	<4 ug/l	4	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
tert-Amyl Methyl Ether (TAME)	<4 ug/l	4	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
tert-Butyl Alcohol (TBA)	<100 ug/l	100	1D42320	OA-1 (GC/MS)	IVK	04/22/04 19:30	
Surrogate 4-Bromofluorobenzene	*100 %*			*81-124*	IVK	04/22/04 19:30	
14D0836-03 B-3				Matrix:Water	Collected: 04/16/04 11:30		

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Barker-Lemar Associates
1801 Industrial Circle
West Des Moines, IA 50265

April 30, 2004

Work Order: 14D0836

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
14D0836-03 B-3				Matrix: Water		Collected: 04/16/04 11:30	
Determination of Volatile Petroleum Hydrocarbons							
Benzene	<1 ug/l	1	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
Toluene	<1 ug/l	1	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
Ethylbenzene	<1 ug/l	1	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
Xylenes, total	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
Methyl-t-butyl Ether (MTBE)	<1 ug/l	1	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
Ethyl-tert-Butyl Ether (ETBE)	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
Di-iso-Propyl Ether (DIPE)	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
tert-Amyl Methyl Ether (TAME)	<2 ug/l	2	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
tert-Butyl Alcohol (TBA)	<50 ug/l	50	1D42221	OA-1 (GC/MS)	IVK	04/21/04 22:36	
Surrogate 4-Bromofluorobenzene	*112 %*			*81-124*	IVK	04/21/04 22:36	
Determination of Extractable Petroleum Hydrocarbons							
TEH, as gasoline	<0 2 mg/l	0.2	1D42331	Iowa OA-2	SMG	04/28/04 19:30	
TEH, as #2 diesel fuel	<0 2 mg/l	0.2	1D42331	Iowa OA-2	SMG	04/28/04 19:30	
TEH, as waste oil	<0 2 mg/l	0 2	1D42331	Iowa OA-2	SMG	04/28/04 19:30	
Total Extractable Hydrocarbons	<0 2 mg/l	0.2	1D42331	Iowa OA-2	SMG	04/28/04 19:30	
Surrogate. Pentacosane	*102 %*			*70-130*	SMG	04/28/04 19:30	

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Barker-Lemar Associates
1801 Industrial Circle
West Des Moines, IA 50265

April 30, 2004

Work Order: 14D0836

Determination of Volatile Petroleum Hydrocarbons - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D42221 - EPA 5030B										
Blank (1D42221-BLK1)				Prepared: 04/20/04 Analyzed: 04/21/04						
Benzene	ND	1	ug/l							
Toluene	ND	1	"							
Ethylbenzene	ND	1	"							
Xylenes, total	ND	2	"							
Methyl-t-butyl Ether (MTBE)	ND	1	"							
Ethyl-tert-Butyl Ether (ETBE)	ND	2	"							
Di-iso-Propyl Ether (DIPE)	ND	2	"							
tert-Amyl Methyl Ether (TAME)	ND	2	"							
tert-Butyl Alcohol (TBA)	ND	50	"							
Surrogate: 4-Bromofluorobenzene	*51.0*		"	*50.0*		*102*	*81-124*			
LCS (1D42221-BS1)				Prepared: 04/20/04 Analyzed: 04/22/04						
Benzene	64.8	1	ug/l	56.0		116	79-135			
Toluene	54.2	1	"	51.5		105	68-141			
Ethylbenzene	62.2	1	"	57.0		109	84-135			
Xylenes, total	120.7	2	"	110.5		109	85-132			
Methyl-t-butyl Ether (MTBE)	188.6	1	"	151.5		124	65-135			
Surrogate: 4-Bromofluorobenzene	*50.5*		"	*50.0*		*101*	*81-124*			
Calibration Check (1D42221-CCV1)				Prepared: 04/20/04 Analyzed: 04/21/04						
Benzene	86.6	1	ug/l	81.0		107	70-130			
Toluene	67.0	1	"	66.5		101	70-130			
Ethylbenzene	74.0	1	"	69.5		106	70-130			
Xylenes, total	159.6	2	"	154.5		103	70-130			
Methyl-t-butyl Ether (MTBE)	75.0	1	"	68.5		109	70-130			
Ethyl-tert-Butyl Ether (ETBE)	73.0	2	"	67.0		109	70-130			
Di-iso-Propyl Ether (DIPE)	70.4	2	"	63.0		112	70-130			
tert-Amyl Methyl Ether (TAME)	66.1	2	"	58.5		113	70-130			
tert-Butyl Alcohol (TBA)	1089	50	"	995.0		109	70-130			
Surrogate: 4-Bromofluorobenzene	*51.6*		"	*50.0*		*103*	*81-124*			

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MRL = Method Reporting Limit

Barker-Lemar Associates
1801 Industrial Circle
West Des Moines, IA 50265

Work Order: 14D0836

Determination of Volatile Petroleum Hydrocarbons - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D42221 - EPA 5030B										
Matrix Spike (1D42221-MS1)	Source: 14D0599-01			Prepared: 04/20/04		Analyzed: 04/22/04				
Benzene	61 9	1	ug/l	56 0	ND	111	63-138			
Toluene	51 5	1	"	51 5	ND	100	72-128			
Ethylbenzene	59 9	1	"	57 0	ND	105	69-139			
Xylenes, total	113 0	2	"	110 5	ND	102	71-136			
Methyl-t-butyl Ether (MIBE)	173 5	1	"	151 5	ND	115	65-127			
Surrogate 4-Bromofluorobenzene	*50 7*		"	*50 0*		*101*	*81-124*			
Matrix Spike Dup (1D42221-MSD1)	Source: 14D0599-01			Prepared: 04/20/04		Analyzed: 04/22/04				
Benzene	62 3	1	ug/l	56 0	ND	111	63-138	0 644	12	
Toluene	51 2	1	"	51 5	ND	99 4	72-128	0 584	21	
Ethylbenzene	58 5	1	"	57 0	ND	103	69-139	2 36	12	
Xylenes, total	111 1	2	"	110 5	ND	101	71-136	1 70	10	
Methyl-t-butyl Ether (MIBE)	179 1	1	"	151 5	ND	118	65-127	3 18	18	
Surrogate 4-Bromofluorobenzene	*50 7*		"	*50 0*		*101*	*81-124*			
Batch 1D42320 - EPA 5030B										
Blank (1D42320-BLK1)				Prepared & Analyzed: 04/22/04						
Benzene	ND	1	ug/l							
Toluene	ND	1	"							
Ethylbenzene	ND	1	"							
Xylenes, total	ND	2	"							
Methyl-t-butyl Ether (MTBE)	ND	1	"							
Ethyl-tert-Butyl Ether (ETBE)	ND	2	"							
Di-iso-Propyl Ether (DIPE)	ND	2	"							
tert-Amyl Methyl Ether (TAME)	ND	2	"							
tert-Butyl Alcohol (TBA)	ND	50	"							
Surrogate 4-Bromofluorobenzene	*49 1*		"	*50 0*		*98 2*	*81-124*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document This analytical report must be reproduced in its entirety Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted MRL = Method Reporting Limit.

Barker-Lemar Associates
1801 Industrial Circle
West Des Moines, IA 50265

Work Order: 14D0836

Determination of Volatile Petroleum Hydrocarbons - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D42320 - EPA 5030B										
LCS (1D42320-BS1)				Prepared: 04/22/04 Analyzed: 04/23/04						
Benzene	61.9	1	ug/l	56.0		111	79-135			
Toluene	53.4	1	"	51.5		104	68-141			
Ethylbenzene	60.3	1	"	57.0		106	84-135			
Xylenes, total	114.5	2	"	110.5		104	85-132			
Methyl-t-butyl Ether (MIBE)	175.7	1	"	151.5		116	65-135			
Surrogate: 4-Bromofluorobenzene	*49.2*		"	*50.0*		*98.4*	*81-124*			
Calibration Check (1D42320-CCV1)				Prepared & Analyzed: 04/22/04						
Benzene	84.5	1	ug/l	81.0		104	70-130			
Toluene	71.6	1	"	66.5		108	70-130			
Ethylbenzene	72.2	1	"	69.5		104	70-130			
Xylenes, total	159.6	2	"	154.5		103	70-130			
Methyl-t-butyl Ether (MIBE)	77.1	1	"	68.5		113	70-130			
Ethyl-tert-Butyl Ether (EIBE)	74.1	2	"	67.0		111	70-130			
Di-iso-Propyl Ether (DIPE)	67.7	2	"	63.0		107	70-130			
tert-Amyl Methyl Ether (TAME)	64.4	2	"	58.5		110	70-130			
tert-Butyl Alcohol (TBA)	1105	50	"	995.0		111	70-130			
Surrogate: 4-Bromofluorobenzene	*48.5*		"	*50.0*		*97.0*	*81-124*			
Matrix Spike (1D42320-MS1)		Source: 14D0837-04		Prepared: 04/22/04 Analyzed: 04/23/04						
Benzene	16630	100	ug/l	5600	10200	115	63-138			
Toluene	9844	100	"	5150	4180	110	72-128			
Ethylbenzene	7128	100	"	5700	1060	106	69-139			
Xylenes, total	15280	200	"	11050	3640	105	71-136			
Methyl-t-butyl Ether (MIBE)	24630	100	"	15150	6920	117	65-127			
Surrogate: 4-Bromofluorobenzene	*49.2*		"	*50.0*		*98.4*	*81-124*			
Matrix Spike Dup (1D42320-MSD1)		Source: 14D0837-04		Prepared: 04/22/04 Analyzed: 04/23/04						
Benzene	16460	100	ug/l	5600	10200	112	63-138	1.03	12	
Toluene	9733	100	"	5150	4180	108	72-128	1.13	21	
Ethylbenzene	7219	100	"	5700	1060	108	69-139	1.27	12	
Xylenes, total	15320	200	"	11050	3640	106	71-136	0.261	10	
Methyl-t-butyl Ether (MIBE)	24460	100	"	15150	6920	116	65-127	0.693	18	
Surrogate: 4-Bromofluorobenzene	*49.8*		"	*50.0*		*99.6*	*81-124*			

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West Des Moines, IA 50265

Determination of Extractable Petroleum Hydrocarbons - Quality Control
Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D42331 - 3510C OA-2 Sep Fnl										
Blank (1D42331-BLK1)				Prepared: 04/23/04 Analyzed: 04/28/04						
TEH, as gasoline	ND	0.1	mg/l							
TEH, as #2 diesel fuel	ND	0.1	"							
TEH, as waste oil	ND	0.1	"							
Total Extractable Hydrocarbons	ND	0.1	"							
Surrogate: Pentacosane	*0.0450*		"	*0.0505*		*89.1*	*70-130*			
LCS (1D42331-BS1)				Prepared: 04/23/04 Analyzed: 04/28/04						
TEH, as #2 diesel fuel	10.33	0.1	mg/l	10.54		98.0	65-110			
Surrogate: Pentacosane	*0.0584*		"	*0.0505*		*116*	*70-130*			
LCS Dup (1D42331-BSD1)				Prepared: 04/23/04 Analyzed: 04/28/04						
TEH, as #2 diesel fuel	11.18	0.1	mg/l	10.54		106	65-110	7.90	20	
Surrogate: Pentacosane	*0.0597*		"	*0.0505*		*118*	*70-130*			
Calibration Check (1D42331-CCV1)				Prepared: 04/23/04 Analyzed: 04/28/04						
TEH, as gasoline	2112		mg/l	2050		103	85-115			
TEH, as #2 diesel fuel	2219		"	2100		106	85-115			
TEH, as waste oil	1980		"	2030		97.5	85-115			
Surrogate: Pentacosane	*0.0528*		"	*0.0505*		*105*	*70-130*			
Calibration Check (1D42331-CCV2)				Prepared: 04/23/04 Analyzed: 04/28/04						
TEH, as gasoline	1771		mg/l	2050		86.4	85-115			
TEH, as #2 diesel fuel	2095		"	2100		99.8	85-115			
TEH, as waste oil	1966		"	2030		96.8	85-115			
Surrogate: Pentacosane	*0.0500*		"	*0.0505*		*99.0*	*70-130*			
Reference (1D42331-SRM1)				Prepared: 04/23/04 Analyzed: 04/28/04						
TEH, as #2 diesel fuel	3805	100	mg/l	5005		76.0	70-130			
Surrogate: Pentacosane	*446.1*		"	*50.50*		*883*	*70-130*			*S-07*

ND = Non Detect; REC= Recovery; RPD= Relative Percent Difference

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1801 Industrial Circle
West Des Moines, IA 50265

Work Order: 14D0836

Notes and Definitions

S-07 The surrogate recovery for this sample is outside of established control limits

End of Report

Jeffrey King

Keystone Laboratories, Inc
Jeffrey King, Ph.D.
Laboratory Director

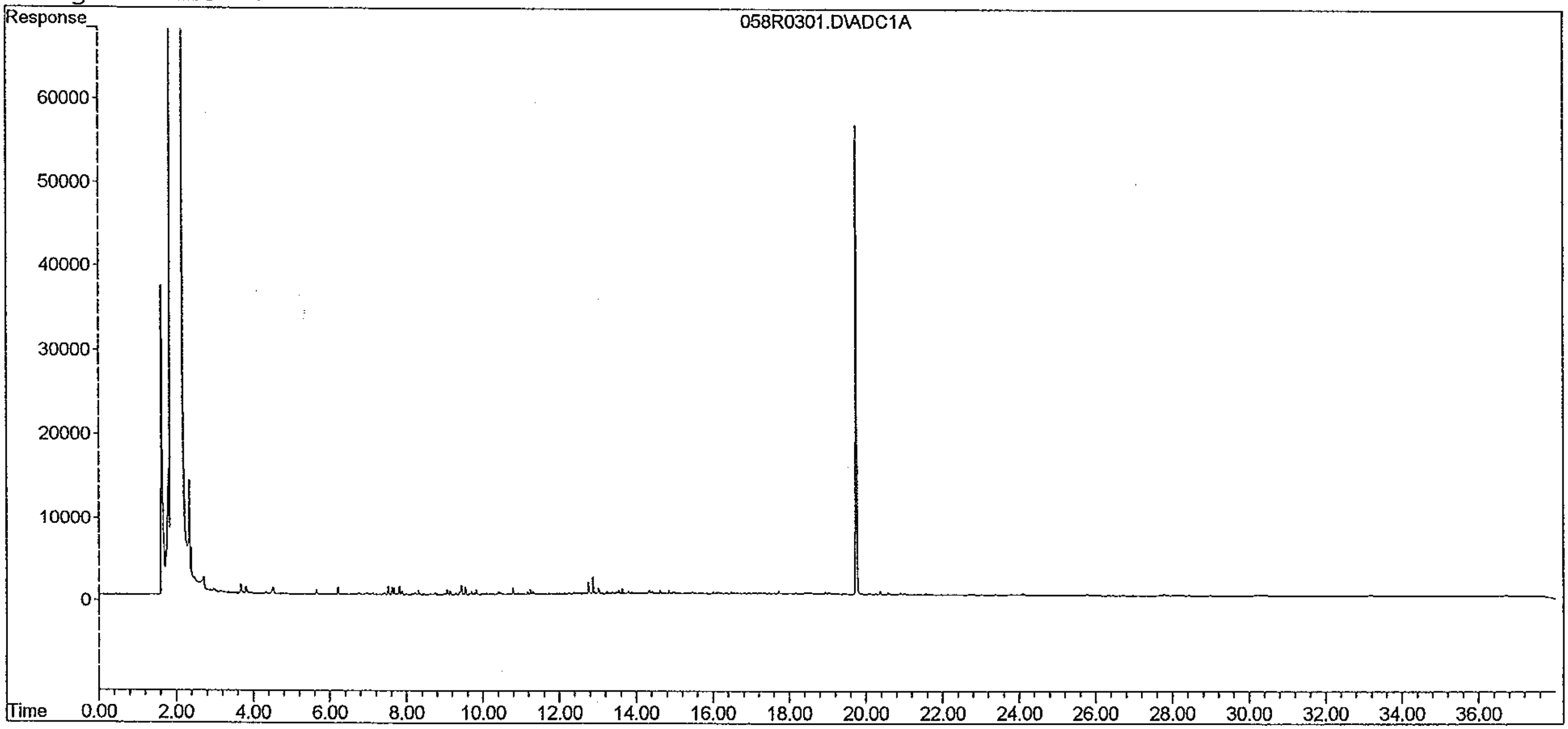
The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit

Data File : G:\HPCHEM\2\DATA\042804A2\058R0301.D Vial: 58
Acq On : 28 Apr 2004 07:30 PM Operator: SMG
Sample : 14D0836-03 Inst : GC #2
Misc : Multiplr: 1.00
IntFile : HYDRO.E
Quant Time: Apr 29 14:27 19104 Quant Results File: R042804.RES

Newton, IA 50208

Quant Method : G:\HPCHEM\2\METHODS\R042804.M (Chemstation Integrator)
Title : 8015-500/OA-2 Method
Last Update : Sat Apr 24 10:03:23 2004
Response via : Multiple Level Calibration
DataAcq Meth : DIESEL.MTH

Volume Inj. :
Signal Phase :
Signal Info :

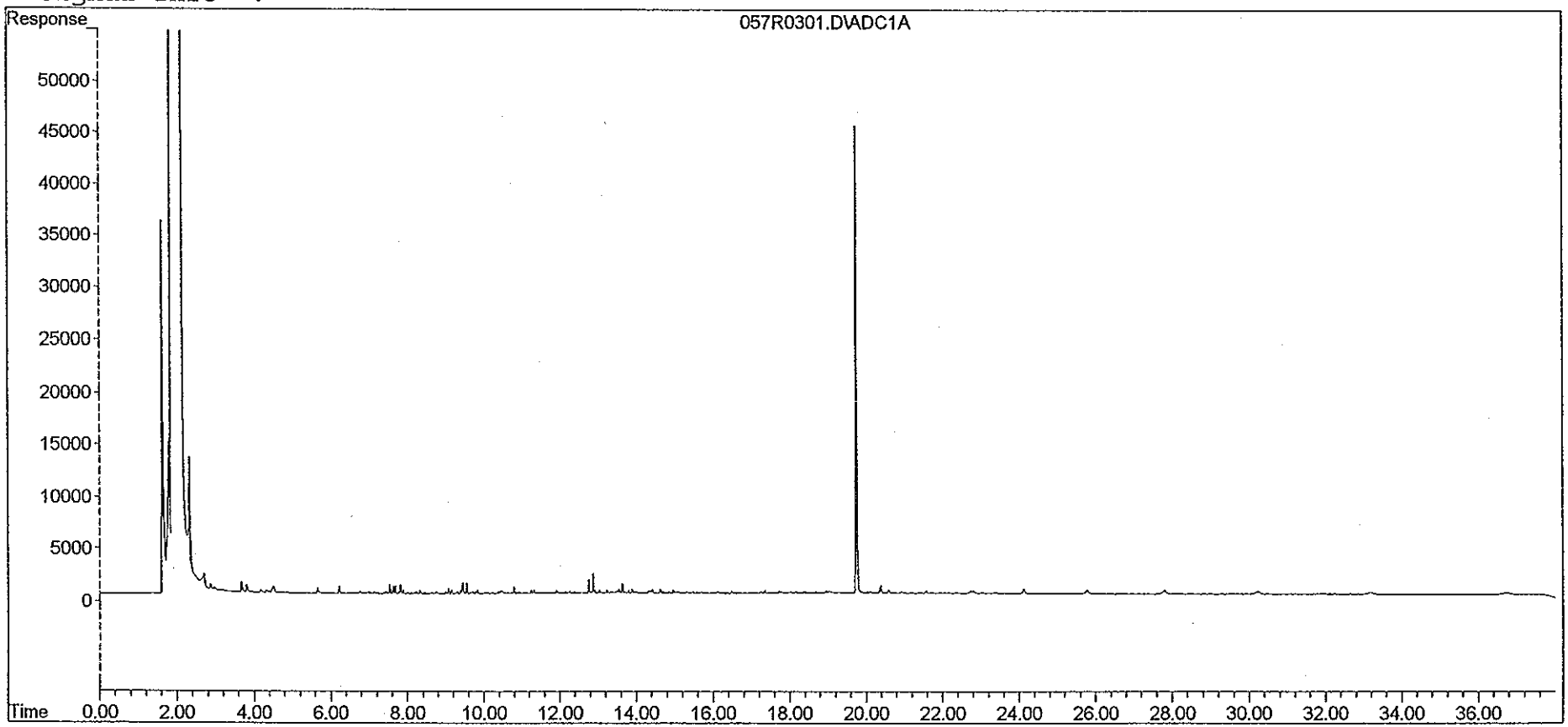


Data File : G:\HPCHEM\2\DATA\042804A2\057R0301.D
Acq On : 28 Apr 2004 06:41 PM
Sample : 14D0836-01
Misc :
IntFile : HYDRO.E
Quant Time: Apr 29 14:26 19104 Quant Results File: R042804.RES

Vial: 57
Operator: SMG
Inst : GC #2
Multiplr: 1.00

Quant Method : G:\HPCHEM\2\METHODS\R042804.M (Chemstation Integrator)
Title : 8015-500/OA-2 Method
Last Update : Sat Apr 24 10:03:23 2004
Response via : Multiple Level Calibration
DataAcq Meth : DIESEL.MTH

Volume Inj. :
Signal Phase :
Signal Info :



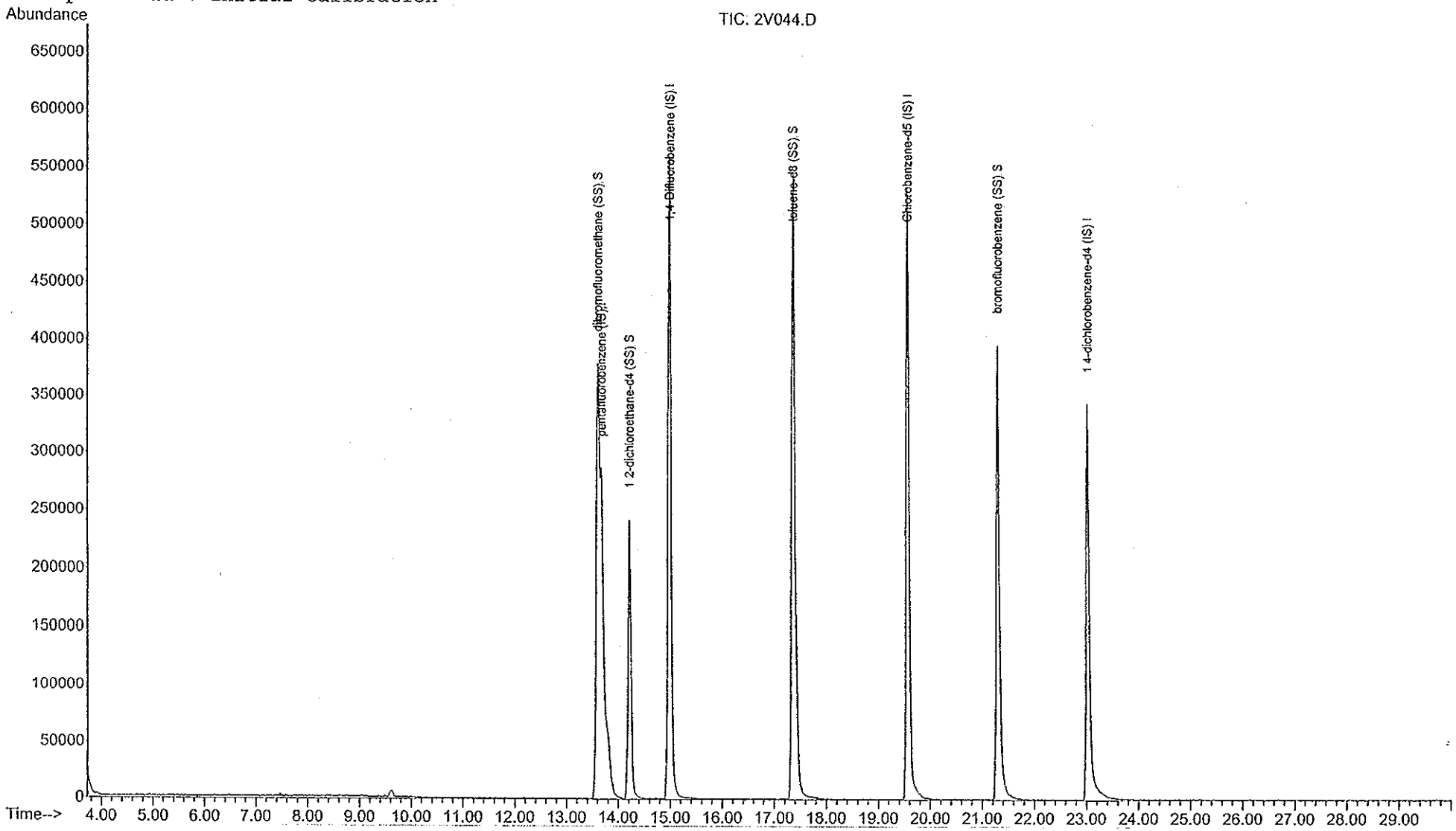
Data File : G:\MSCHEM\2\DATA\042004A2\2V044.D
Acq On : 21 Apr 2004 10:36 pm
Sample : 14D0836-03
Misc :
MS Integration Params: rteint.p
Quant Time: Apr 22 14:55 2004

Vial: 21
Operator: TVK
Inst : MS #2
Multiplr: 1.00

Quant Results File: BW041204.RES

Keystone Laboratories, Inc.
600 East 17th St. South
Newton, IA 50208

Method : G:\MSCHEM\2\METHODS\BW041204.M (RTE Integrator)
Title : BTEX Water
Last Update : Tue Apr 13 07:55:59 2004
Response via : Initial Calibration



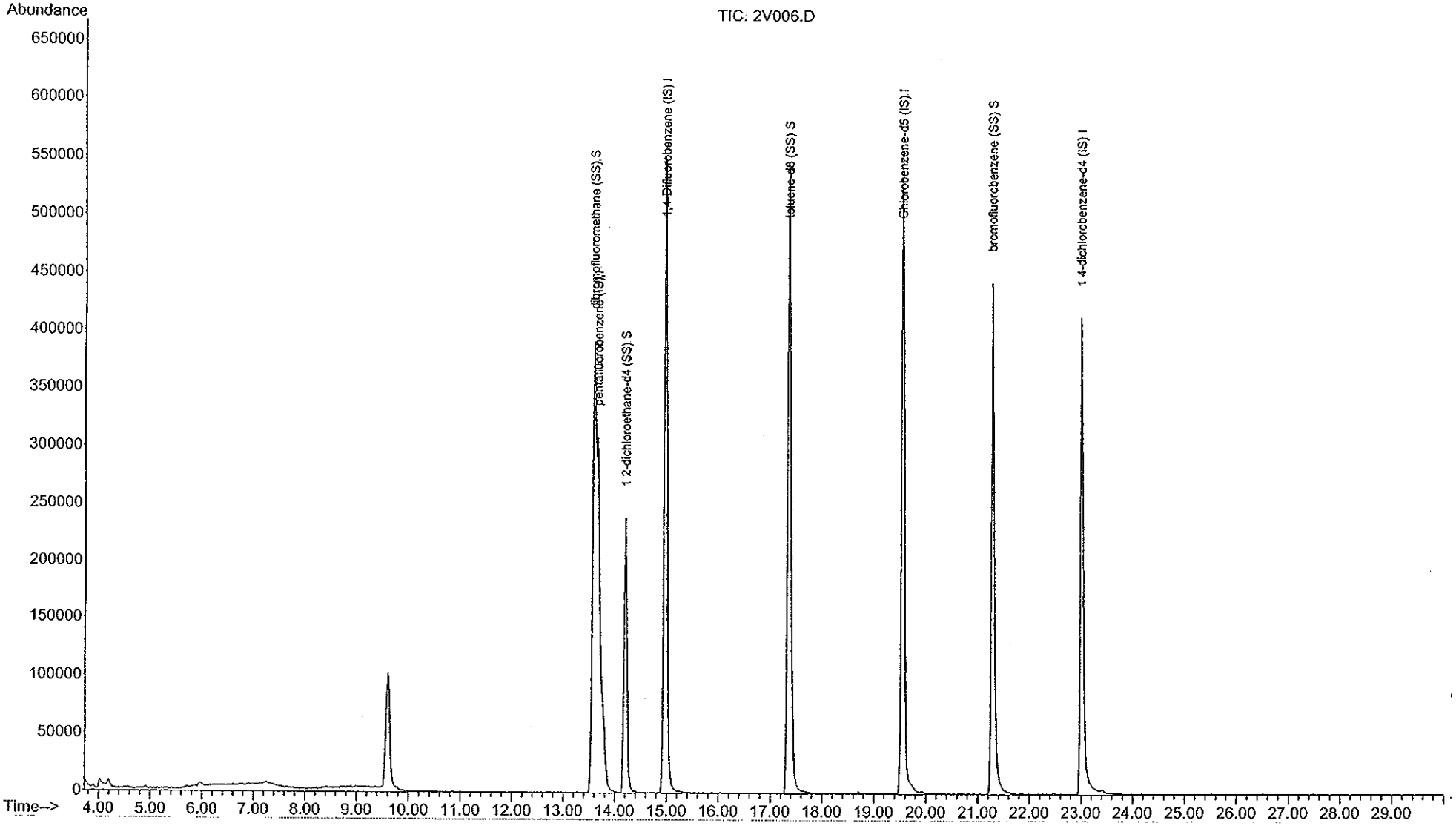
Data File : G:\MSCHEM\2\DATA\042204A2\2V006.D
Acq On : 22 Apr 2004 7:30 pm
Sample : 14D0836-02
Misc : 2X
MS Integration Params: rteint.p
Quant Time: Apr 23 13:46 2004

Vial: 6
Operator: TVK
Inst : MS #2
Multiplr: 1.00

Quant Results File: BW041204.RES

Keystone Laboratories, Inc.
600 East 17th St. South
Newton, IA 50208

Method : G:\MSCHEM\2\METHODS\BW041204.M (RTE Integrator)
Title : BTEX Water
Last Update : Tue Apr 13 07:55:59 2004
Response via : Initial Calibration



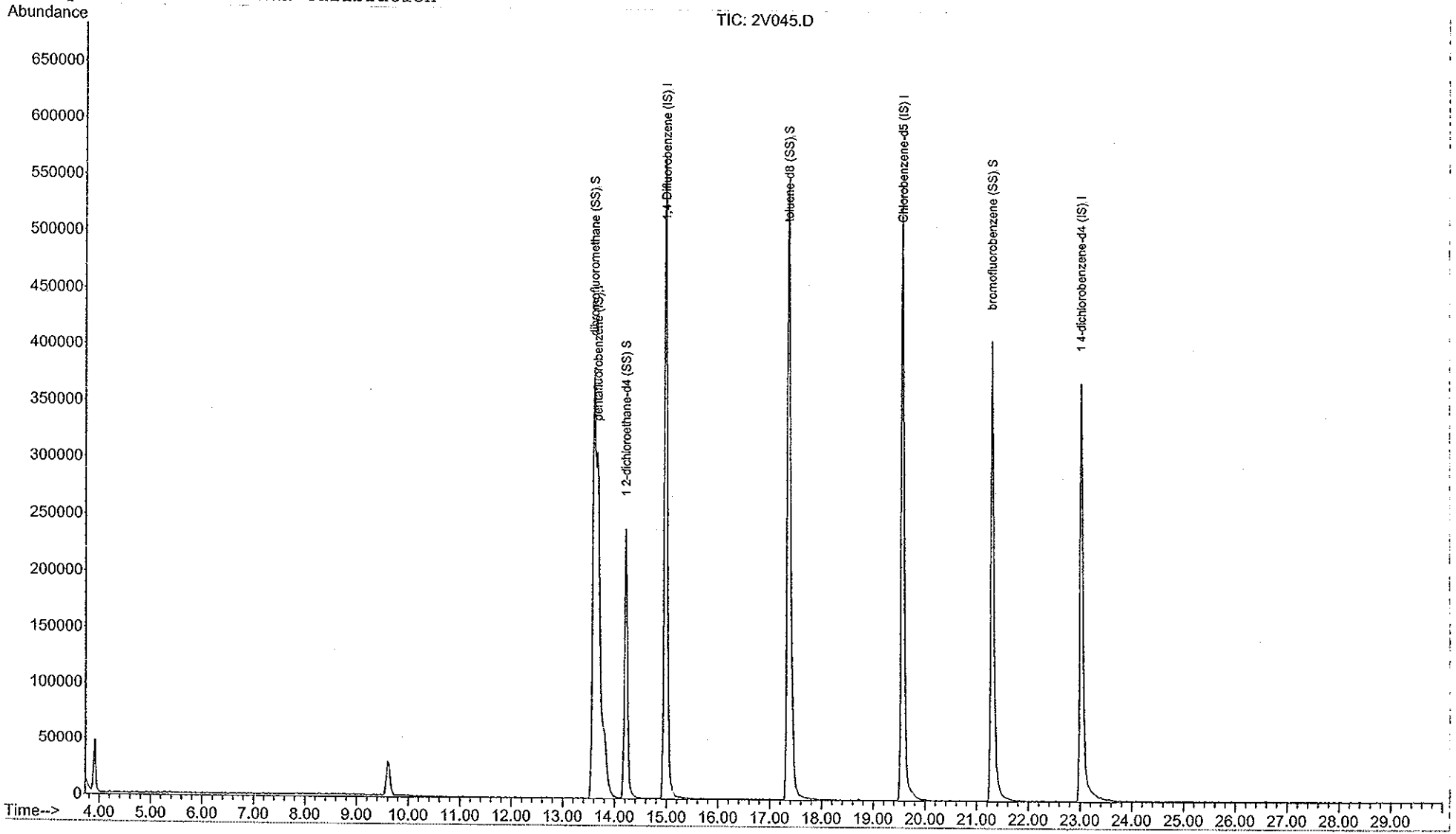
Data File : G:\MSCHEM\2\DATA\042004A2\2V045.D
Acq On : 21 Apr 2004 11:15 pm
Sample : 14D0836-01
Misc : 2X
MS Integration Params: rteint.p
Quant Time: Apr 22 14:55 2004

Vial: 22
Operator: TVK
Inst : MS #2
Multiplr: 1.00

Quant Results File: BW041204.RES

Keystone Laboratories, Inc.
600 East 17th St. South
Newton, IA 50208

Method : G:\MSCHEM\2\METHODS\BW041204.M (RTE Integrator)
Title : BTEX Water
Last Update : Tue Apr 13 07:55:59 2004
Response via : Initial Calibration



CHAIN OF CUSTODY RECORD

Keystone LABORATORIES, INC.

☐ 600 E. 17th St. S.
Newton, IA 50208
Phone: 641-792-8451
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☐ 3012 Ansborough Ave.
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Fax: 319-235-2480
www.keystonelabs.com

☐ 1304 Adams
Kansas City, KS 66103
Phone: 913-321-7856
Fax: 913-321-7937

PRINT OR TYPE INFORMATION BELOW

SAMPLER: Kevin Hensley
SITE NAME: IADNR 001
ADDRESS:
CITY/ST/ZIP:
PHONE:

REPORT TO:
NAME: Christy Jaworski
COMPANY NAME: Bucher Lemar
ADDRESS: 1801 Industrial Cir
CITY/ST/ZIP: WDM IA, 50265
PHONE:
FAX:

BILL TO:
NAME:
COMPANY NAME:
ADDRESS:
CITY/ST/ZIP:
PHONE:

Keystone Quote No.: (If Applicable)

CLIENT SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	NO. OF CONTAINERS	MATRIX	GRAB/COMPOSITE	ANALYSES REQUIRED: BTEX/MTBE (6C/MS)	ANALYSES REQUIRED: TEH OA-2	LABORATORY SAMPLE NUMBER
	4/16	11:00	B-1	4	GW	G	X	X	01
	4/16	11:15	B-2	2	GW	G	X		02
	4/16	11:30	B-3	4	GW	G	X	X	03

LAB USE ONLY

LABORATORY WORK ORDER NO.: 1410836

SAMPLE TEMPERATURE UPON RECEIPT: °C

SAMPLE CONDITION/COMMENTS:

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	Turn-Around
	4/16			☐ Standard ☐ Rush ____ Contact Lab Prior to Submission
Relinquished by: (Signature)	Date / Time	Received for Lab by: (Signature)	Date / Time	Remarks:
		Bill	4/16/04 12:35 P.m	

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

FORM: CCR 7-97

BARKER LEMAR
ENGINEERING CONSULTANTS

Summary of Activities
Iowa USTfields Project – City of Des Moines
Property Owner – Des Moines Independent Community School District
1820 (AKA-1824) Forest Avenue
Des Moines, IA
Overexcavation Activities

1.0 INTRODUCTION

BARKER LEMAR ENGINEERING CONSULTANTS was contracted by the Iowa Department of Natural Resources in partnership with the City of Des Moines, the EPA, and the Iowa Underground Storage Tank Financial Responsibility Program to assess and clean up contaminated sites within the pilot project area with the ultimate goal of redevelopment The sites are located in the Drake Neighborhood area within the City of Des Moines

Initial activities included identifying sites where potential petroleum contamination could hinder future development activities The potential petroleum contaminated sites were identified by a search of Polk directories, Sanborn maps, a review of IDNR underground storage tank and leaking underground storage tank records, and a review of the Fire Marshall's records

The site at 1820 Forest Avenue is currently owned by the Des Moines Independent Community School District, and is a vacant lot, recently graded and seeded Records indicate a station was originally built at the site in 1946, and operated as a filling station until approximately 1956 The location of the subject site is shown in Figure 1

2.0 PREVIOUS WORK

Polk directories were reviewed at the Des Moines Library The directory was reviewed in approximate five-year intervals Information in the directory indicated the site was a George Hannum Filling Station from 1946 through 1950, and a Clare Houghton Filling Station through 1955 The 1956 Sanborn map showed a gas station located on the site

and two tanks were reportedly located on the east side of the property, approximately 40 feet south of Forest Avenue and 5 feet east of 19th Street.

According to Matt Porter with the Fire Department, no information is available on the type of tanks on site, when/if these tanks were removed, or if contamination was found during removal.

On February 23, 2004, BARKER LEMAR personnel installed three soil borings, which were converted to temporary monitoring wells. Soil and groundwater samples were collected for petroleum hydrocarbon analysis. Soil and groundwater samples did not indicate any petroleum hydrocarbon contamination present. Site visual observations did not indicate evidence of underground storage tanks. Details of this work were submitted in a report dated May 3, 2004.

To further evaluate the possible presence of underground storage tanks, BARKER LEMAR personnel conducted an electromagnetic survey of the site on August 15, 2004. Based on the survey data, limited subsurface assessment in the form of shallow probes was recommended to further assess areas identified as possible tanks in the electromagnetic survey. These included the north central portion of the property and the central portion of the property along the east side. Further details of the electromagnetic survey can be found in the report submitted to the IDNR dated September 28, 2004.

BARKER LEMAR personnel were on site on December 27, 2004, to conduct shallow geoprobe drilling in the suspect areas observed during the electromagnetic survey. Borings were concentrated on the northeast corner due to information found in the Sanborn, and along the north central and central portion of the property on the east side based on the electromagnetic survey results. Borings B-1 and B-5 encountered resistance at a depth of approximately five (5) feet below ground surface. This is in the location of one of the suspect areas identified during the electromagnetic survey. Further details of the geoprobe work can be found in the report submitted to the IDNR dated January 17, 2005.

3.0 OVEREXCAVATION WORK

To verify no underground storage tanks were present on the site, excavation activities were proposed in the area where the geoprobe encountered obstruction. This work was approved by the IDNR on February 10, 2005, and an access agreement with the Des Moines Independent Community School District was received on February 18, 2005.

On February 22, 2005, **BARKER LEMAR** personnel used a backhoe to excavate the area in the vicinity of geoprobe borings B-1 and B-5. Four trenches were installed adjacent to each other to explore the area and minimize the disturbance to the site. The area excavated is shown in Figure 2. Trenches were installed to a depth of approximately 8 feet below ground surface (bgs). Some old pipe material was observed in the trench area (photo 2 in Appendix A) and an old brick foundation was observed in the area identified as disturbed during the electromagnometer survey and in the area of obstruction during geoprobe activities (photos 4 and 6). No underground storage tanks were observed. The area was backfilled with the removed soil at the completion of the excavation activities.

4.0 CONCLUSION

BARKER LEMAR conducted assessment activities to identify potential buried underground storage tanks located on the property owned by the Des Moines Independent Community School District at 1820 Forest Avenue in Des Moines, Iowa. Excavation activities identified what appeared to be a former foundation made of brick. The location of this foundation corresponded to the area of disturbance in the electromagnetic survey and in the area of obstruction during geoprobe activities. No underground storage tanks were observed.

BARKER LEMAR

ENGINEERING CONSULTANTS

We have appreciated being of service to you on this project. If you have any questions concerning this submittal, please do not hesitate to contact our office

Sincerely,

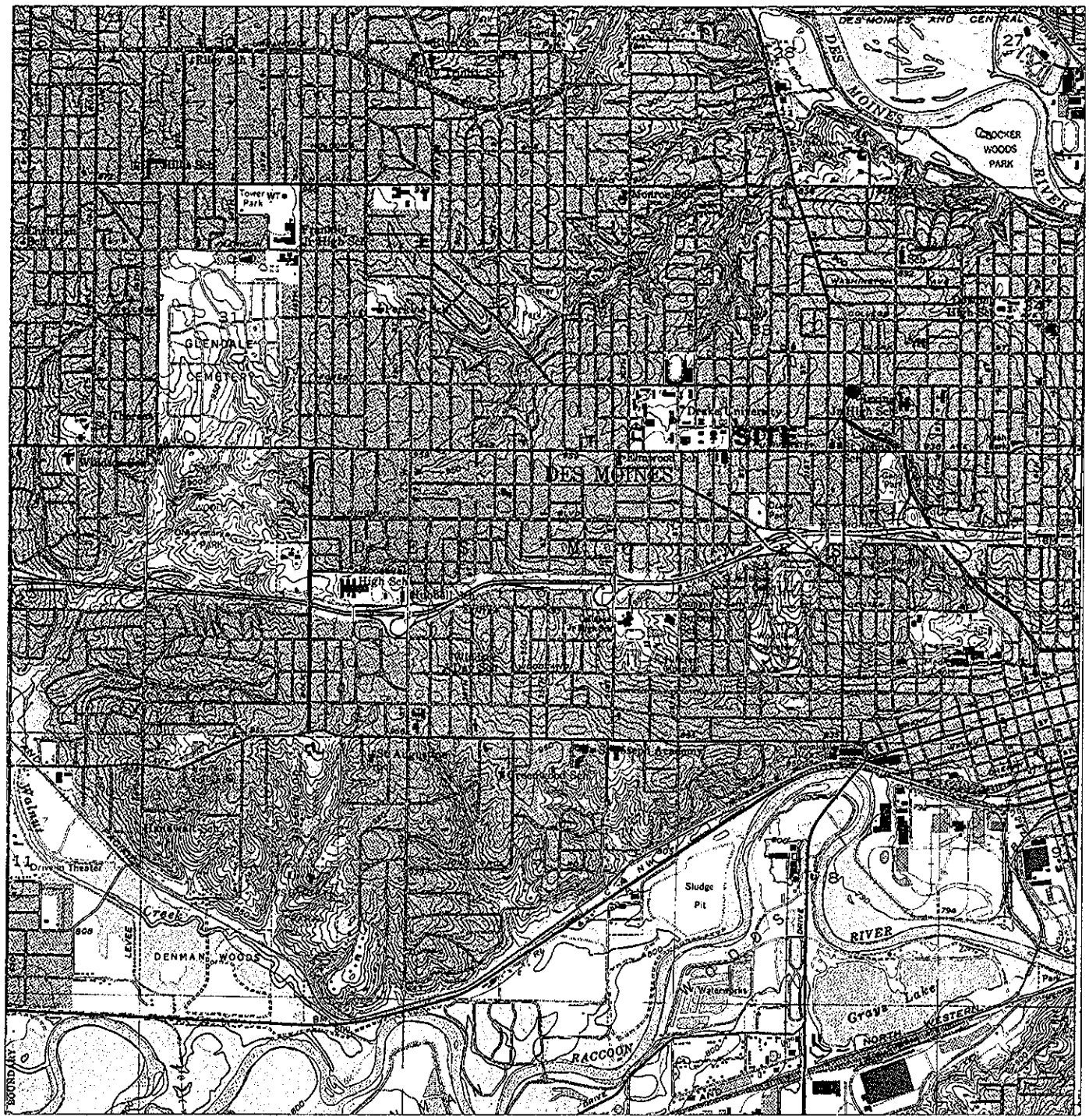
BARKER LEMAR ENGINEERING CONSULTANTS

Christy L. Jaworski
Senior Project Manager

Anita Maher-Lewis
Regional Manager

FIGURE 1

SITE LOCATION MAP



SCALE

0 3000 FT.

REFERENCE USGS QUADRANGLE : DES MOINES SW
FROM NRSC/ISU G.I.S.

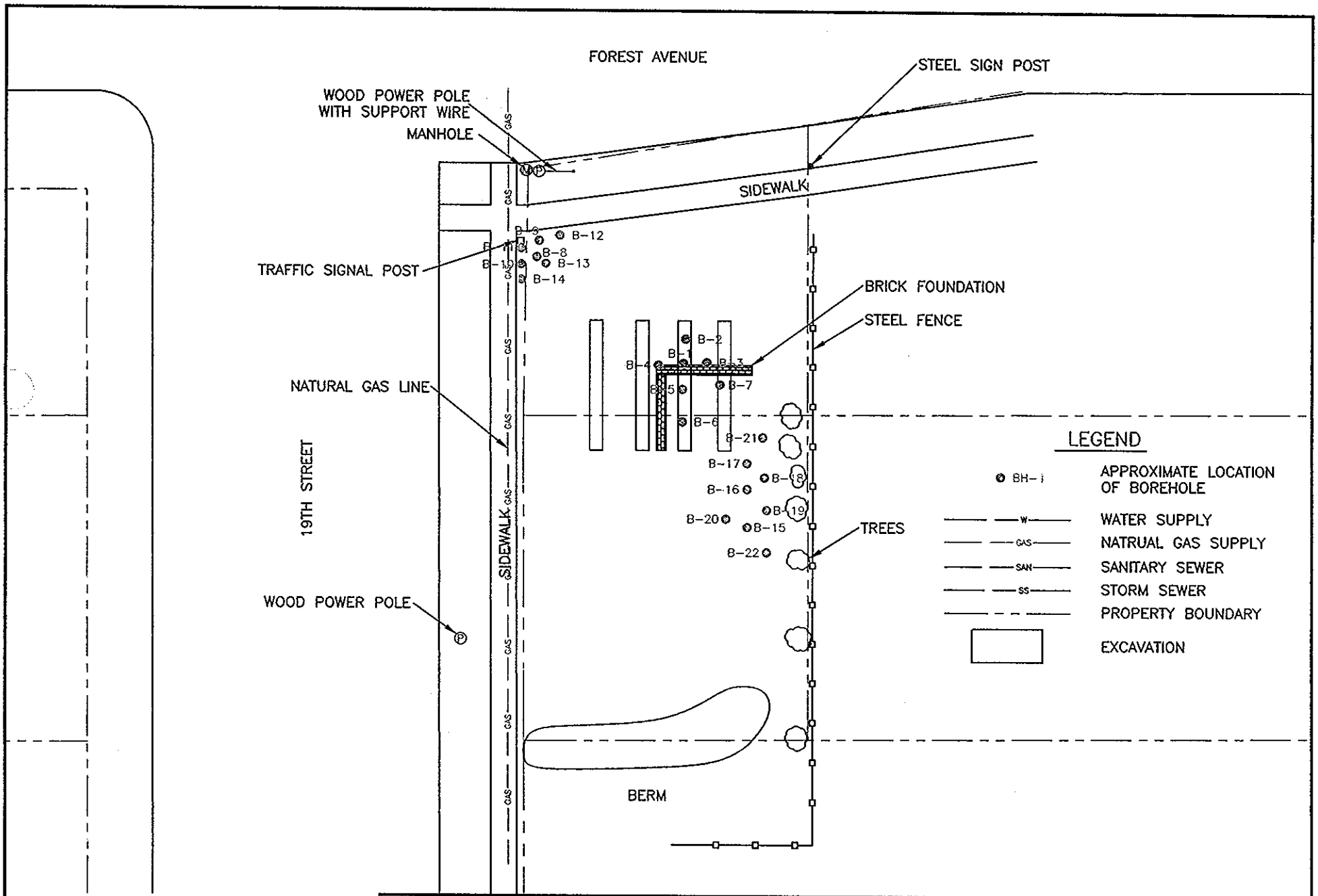
TOPOGRAPHIC SITE MAP
VACANT LOT
1824 FOREST AVENUE
PROJECT NO. IADNR 005
DRAWING DATE: MARCH, 2005

BARKER LEMAR
ENGINEERING CONSULTANTS
1801 Industrial Circle - West Des Moines, Iowa - 50265
Phone: 515.256.8814 - Fax: 515.256.0152 - www.barkerlemar.com

FIGURE
1

FIGURE 2

SITE MAP



SITE PLAN MAP
VACANT LOT
1824 FOREST AVENUE
PROJECT NO. IADNR 005
DRAWING DATE: MARCH, 2005

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FIGURE
2

APPENDIX A

PHOTOGRAPHS

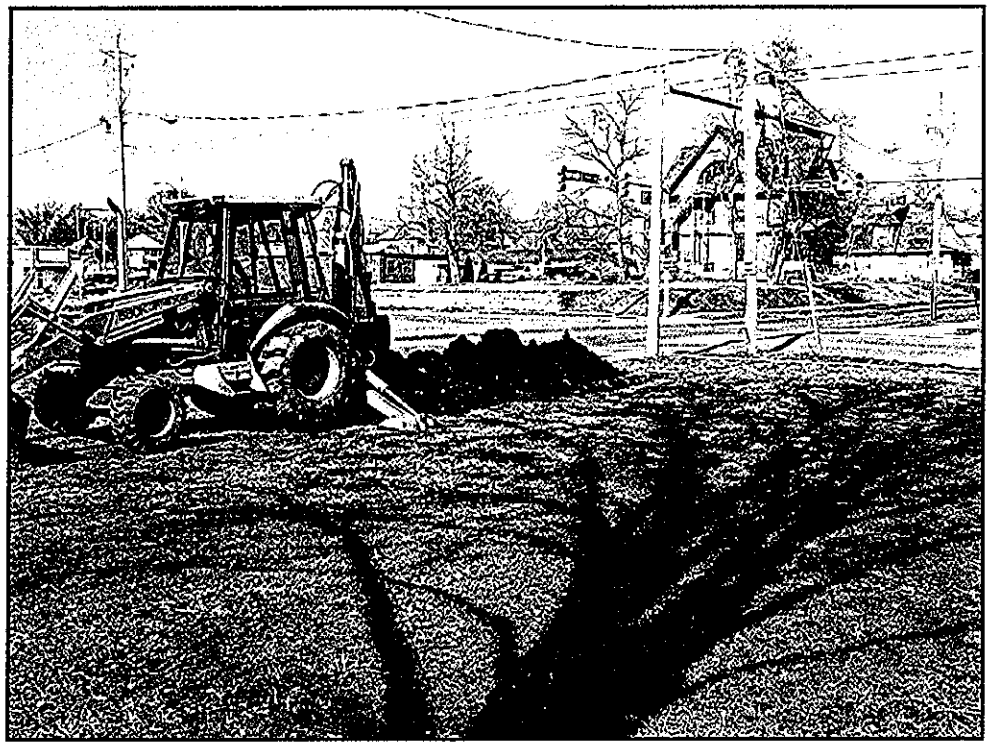

PHOTO 1 – VIEW TOWARD THE NORTHWEST OF BEGINNING OF EXCAVATION.

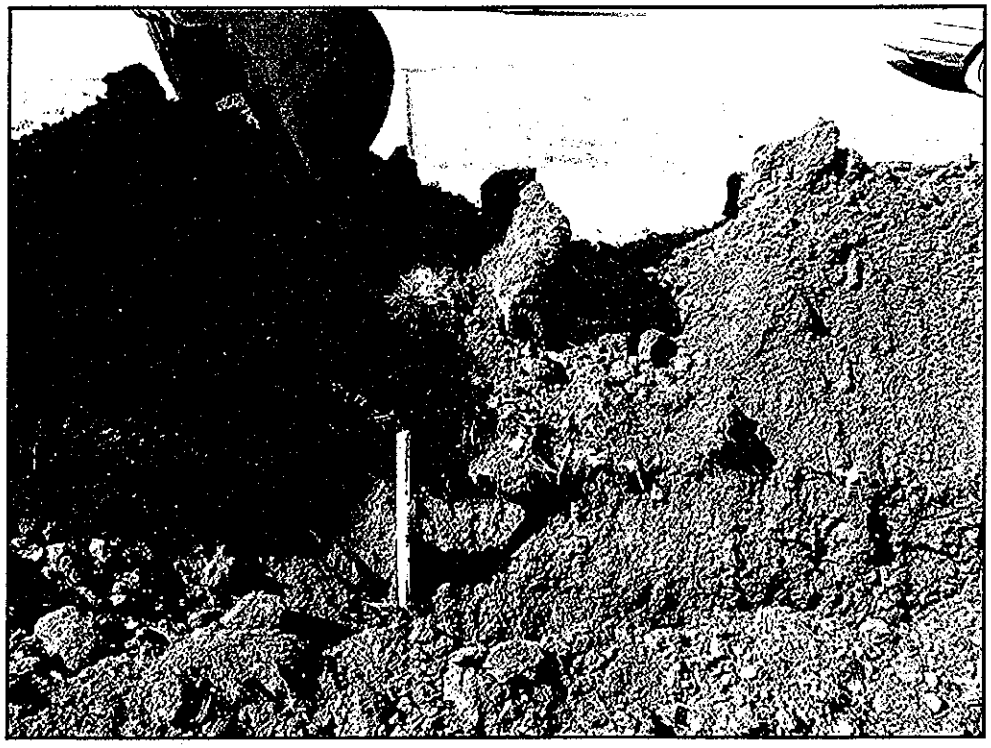

PHOTO 2 – VIEW OF PIPE IN EXCAVATION AREA.

SITE PHOTOGRAPHS
DES MOINES USTFIELDS
1820 FOREST AVENUE
PROJECT NO: IADNR 005
PICTURE DATE: FEBRUARY, 2005

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APPENDIX
A

PHOTO 3 – VIEW TOWARD THE SOUTH OF FIRST TRENCH AREA

PHOTO 4 – VIEW OF FOUNDATION IN TRENCH AREA

SITE PHOTOGRAPHS
DES MOINES USTFIELDS
1820 FOREST AVENUE
PROJECT NO: IADNR 005
PICTURE DATE: FEBRUARY, 2005

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APPENDIX
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PHOTO 5 – VIEW TOWARD THE SOUTH OF EXCAVATION ACTIVITIES.

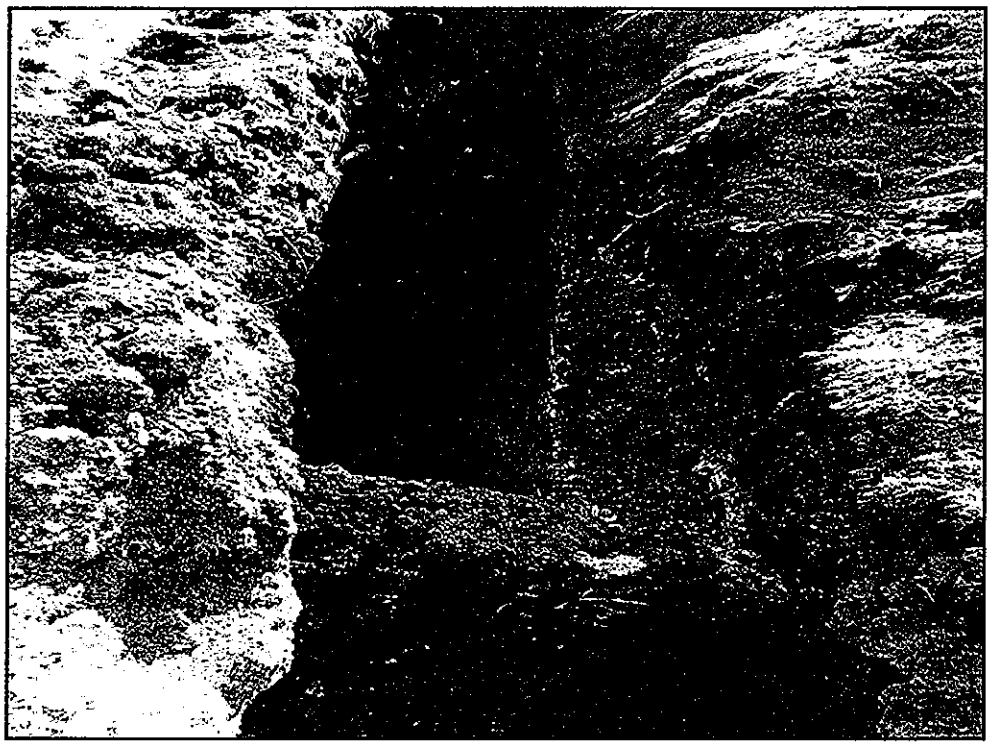

PHOTO 6 – VIEW OF FOUNDATION

SITE PHOTOGRAPHS
DES MOINES USTFIELDS
1820 FOREST AVENUE
PROJECT NO: IADNR 005
PICTURE DATE: FEBRUARY, 2005

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APPENDIX
A

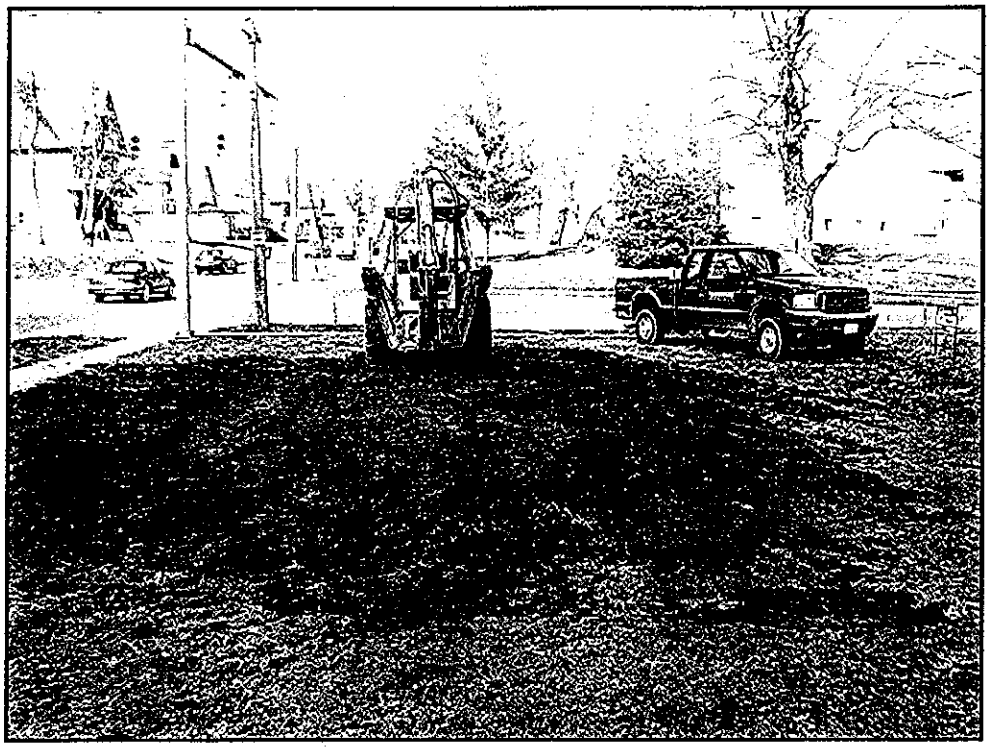

PHOTO 7 – VIEW TOWARD THE NORTH OF AREA AT COMPLETION OF EXCAVATION.

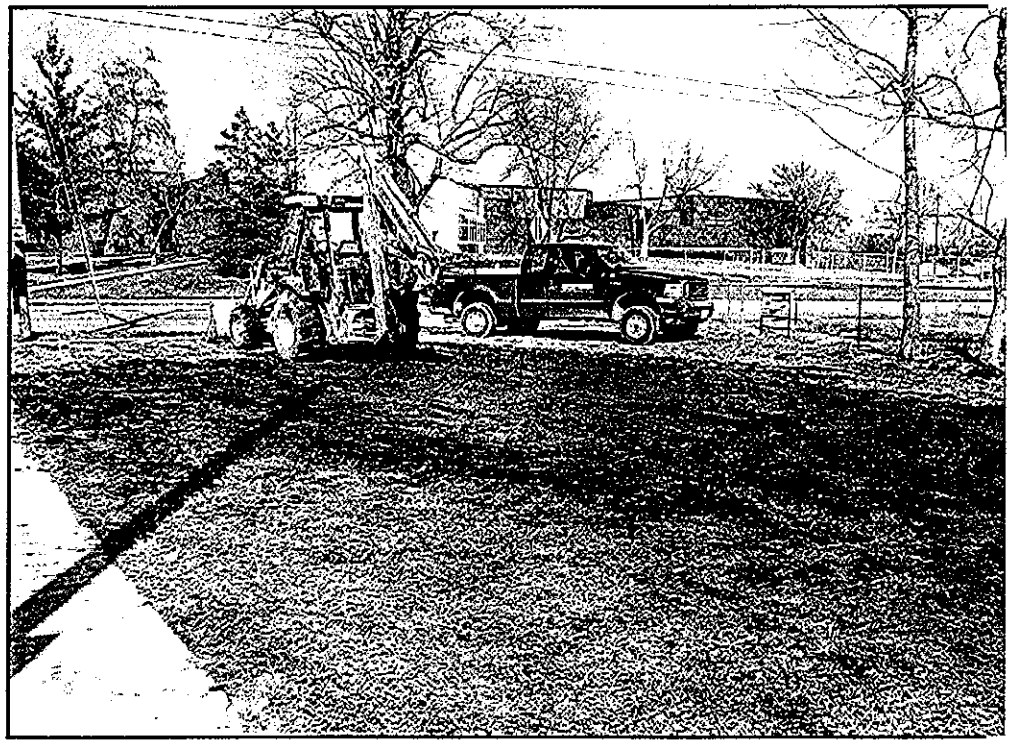

PHOTO 8 – VIEW TOWARD THE NORTH/NORTHEAST OF AREA AT COMPLETION OF EXCAVATION.

SITE PHOTOGRAPHS
DES MOINES USTFIELDS
1820 FOREST AVENUE
PROJECT NO: IADNR 005
PICTURE DATE: FEBRUARY, 2005

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APPENDIX
A